PIONEER®
The Art of Entertainment

Service Manual

ORDER NO.
ARP2393

MULTI – PLAY COMPACT DISC PLAYER

PD-Z85M

KUC, KC, HPW, SD

- **Refer to the service manual ARP2132 for PD-Z84M.**
- **This manual is applicable to the PD-Z85M/KUC, KC, HPW and SD types.**

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IFN JAN. 1992 Printed in Japan

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING
Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SAFETY INFORMATION

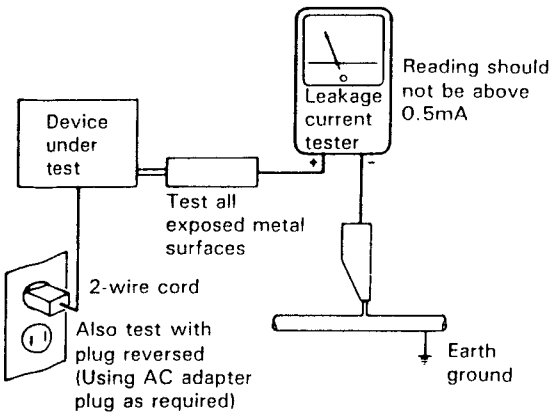
-(FOR USA MODEL ONLY)-

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.


Leakage current tester
Reading should not be above 0.5mA
Device under test
Test all exposed metal surfaces
2-wire cord
Also test with plug reversed (Using AC adapter plug as required)
Earth ground

AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.
The use of a substitute replacement component which dose not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

2. CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- *Part without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *Parts marked by " ◉ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

PD-Z85M/KUC, HPW, SD and PD-Z84M/HEM have the same construction except for the following:

Mark	Symbol & Description	Part No.				Remarks
		PD-Z84M /HEM	PD-Z85M /KUC	PD-Z85M /HPW	PD-Z85M /SD	
◉	Mother board assembly	PWM1370	PWM1373	PWM1370	PWM1371	
⚠	AC power cord	PDG1008	RDG1015	PDG1011	RDG1003	
⚠	Power transformer (AC220V, 240V)	PTT1125	• • • • •	PTT1125	• • • • •	
⚠	Power transformer (AC120V)	• • • • •	PTT1171	• • • • •	• • • • •	
⚠	Power transformer (AC110V, 120-127V, 220V, 240V)	• • • • •	• • • • •	• • • • •	PTT1126	
⚠	Line voltage selector (AC110V, 120-127V, 220V, 240V)	• • • • •	• • • • •	• • • • •	PSB1002	
⚠	Strain relief	CM-22B	CM-22C	CM-22B	CM-22B	
	Function button	PAC1535	PAC1678	PAC1678	PAC1678	
	Display window	PAM1458	PAM1566	PAM1565	PAM1565	
	Door name plate	PAM1461	• • • • •	• • • • •	• • • • •	
	Function panel	PNW1889	PNW2151	PNW2151	PNW2151	
	Door (BK)	PNW1894	PNW2158	PNW2158	PNW2158	
	CD packing case	PHG1594	PHG1786	PHG1775	PHG1775	For packing
	Shield plate	• • • • •	PNB1368	PNB1368	PNB1368	For power transformer
	Operating instructions (English)	• • • • •	PRB1167	PRB1167	PRB1167	
	Operating instructions (Spanish)	• • • • •	• • • • •	• • • • •	PRC1041	
	Operating instructions (English, French, Dutch, Italian, German, Swedish, Spanish, Portuguese)	PRE1138	• • • • •	• • • • •	• • • • •	

Note: *KC type is identical to KUC type but with additional (French) operatng instructions.*

Model Name	Operating Instructions (French)
PD-Z85M/KC	ARC1341 (for Receiver)
	PRC1050

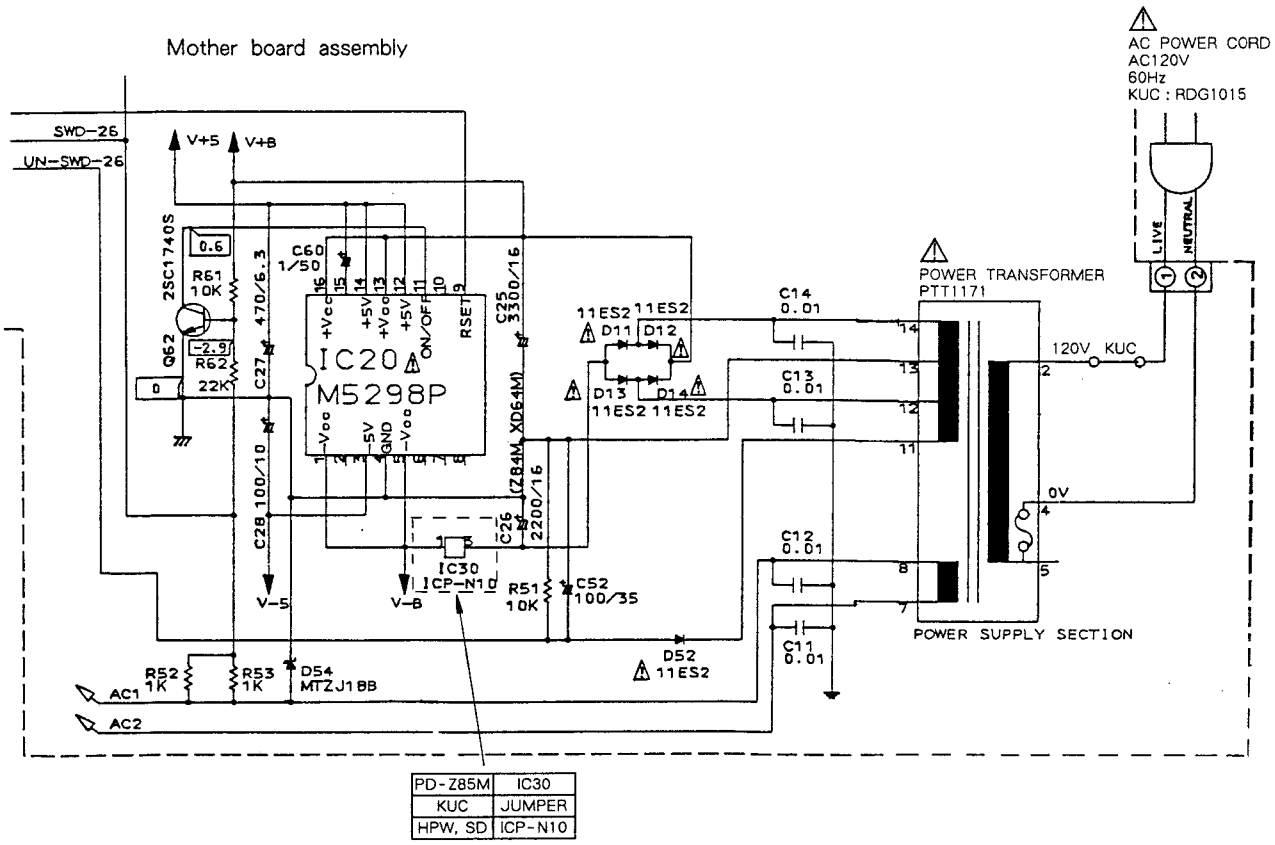
MOTHER BOARD ASSEMBLY (PWM1373 and PWM1371)

The mother board assembly (PWM1373 and PWM1371) and the mother board assembly (PWM1370) have the same construction except for the following:

Mark	Symbol & Description	Part No.			Remarks
		PWM1370	PWM1373	PWM1371	
⚠	IC30	ICP-N10	• • • • •	ICP-N10	
	IC401	TC9237N	TC9237BN	TC9237N	

3. SCHEMATIC DIAGRAM OF THE POWER SUPPLY SECTION

• For PD-Z85M/KUC type



PD-Z85M	IC30
KUC	JUMPER
HPW, SD	ICP-N10

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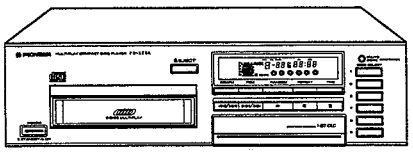

ORDER NO.
ARP2132

MULTI—PLAY COMPACT DISC PLAYER

PD-Z84M
PD-Z970M

PD-Z84M AND PD-Z970M HAVE FOLLOWING VERSIONS :

Type	Applicable model		Power requirement	Destination
	PD-Z84M	PD-Z970M		
HEM	○	○	AC220V, 240V (switchable) *	European continent
HB	○	○	AC220V, 240V (switchable) *	United Kingdom
HPW	○	—	AC220V, 240V (switchable) *	Australia
SD	○	○	AC110V, 120V—127V, 220V, 240V (switchable)	Kingdom of Saudi Arabia and General market

*Change position of jumper wire for transformer on MOTHER BOARD assembly.

- **This manual is applicable to the PD-Z84M/HEM, HB, HPW, SD, PD-Z970M/HEM, HB, and SD types.**
- **As to the PD-Z84M/HB, HPW, SD, PD-Z970M/HB and SD types, refer to page 77.**

- **Ce manuel pour le sevice comprend les explications de réglage on français.**
- **Este manual de servicio trata del método ajuste escrito en español.**
- **As to the mechanism description, refer to the PD-Z84M service guide (ARP2190).**

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1. SAFETY INFORMATION

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn varoitusmerkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

LASER
Picture 1
Warning sign for laser radiation

LABEL CHECK (MULTI MAGAZINE type)

HB and HBXJ types

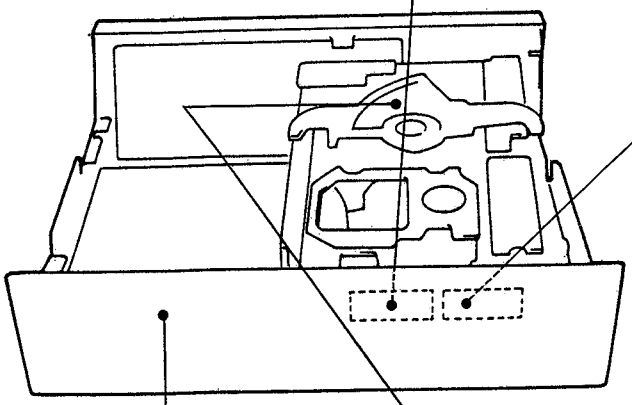
ADVARSEL
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHED SAFBRYDERE ER UDE AF FUNKTION.
UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT!
UNSICHTBARE LASER-STRAHLUNG TRITT AUS, WENN DECKEL (ODER KLAPPE) GEÖFFNET IST! NICHT DEM STRAHL AUSSETZEN!
VRW1094

HEM and HEMXJ types

CAUTION
INVISIBLE LASER RADIATION WHEN OPEN, AVOID EXPOSURE TO BEAM
PRW1018

HEM type

VARO!
Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.
VARNING!
Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.
PRW1233



CLASS 1
LASER PRODUCT
VRW-328

HEM, HB, HEMXJ and HBXJ types

Additional Laser Caution

1. Laser Interlock Mechanism
   The ON/OFF (ON : low level, OFF : high level) status of the LPS1 (S601) and LPS2 (S602) switches for detecting the loading state is detected by the system microprocessor, and the design prevents laser diode oscillation when both switches LPS1 and LPS2 are not ON (low level)(clamped state).
   Thus, interlock will no longer function if switches LPS1 (S601) and LPS2(S602) are deliberately shorted.
   Also, in the test mode*, the interlock mechanism does not operate too.
   Laser diode oscillation will continue if pins 2 and 3 of CXA1471S (IC101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q101 are shorted to each other (fault condition).

2. When the cover is opened with the servo mechanism block removed to be turned over, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 or higher laser beam.

* Refer to page 31.

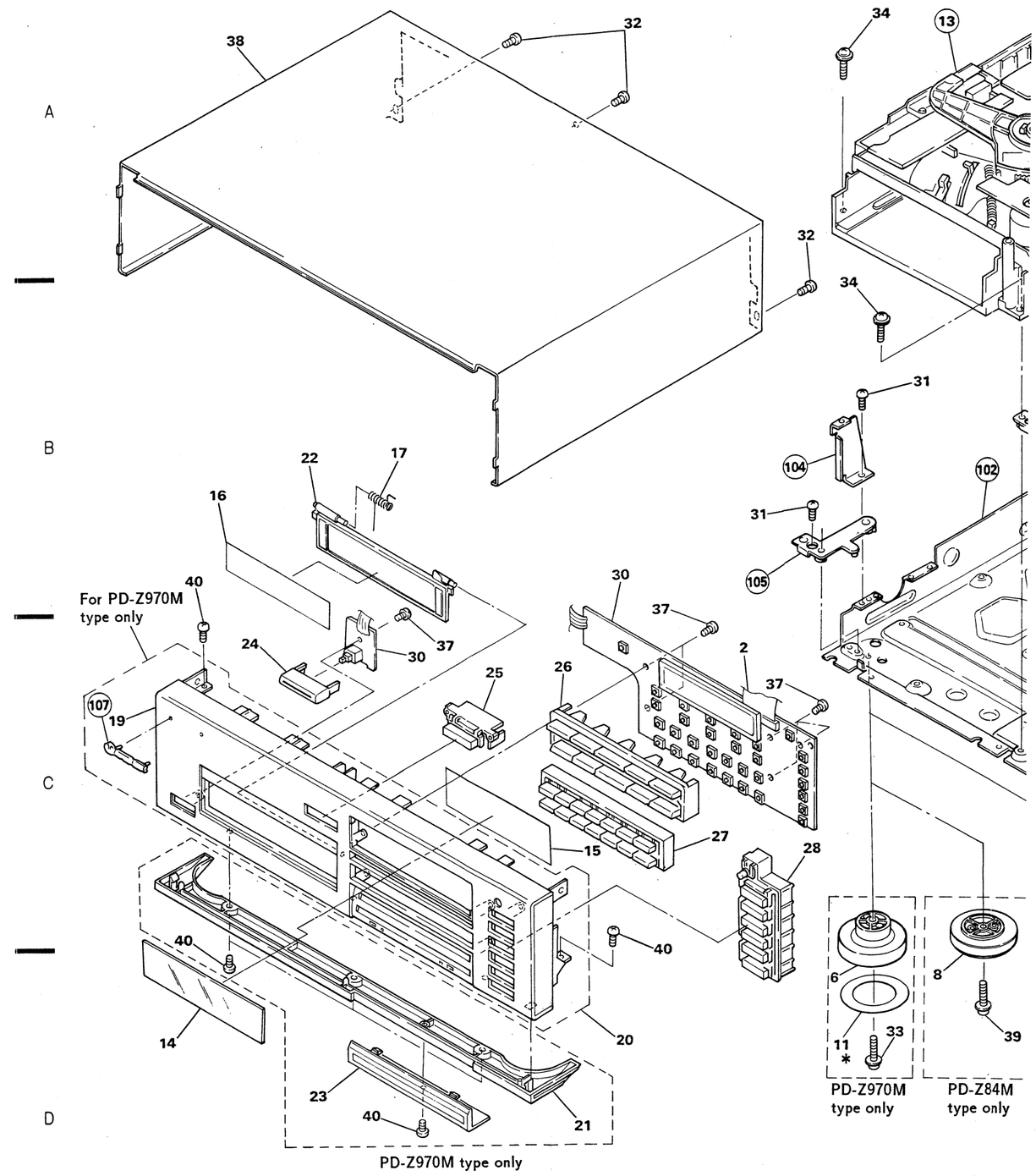
2. EXPLODED VIEWS AND PARTS LIST

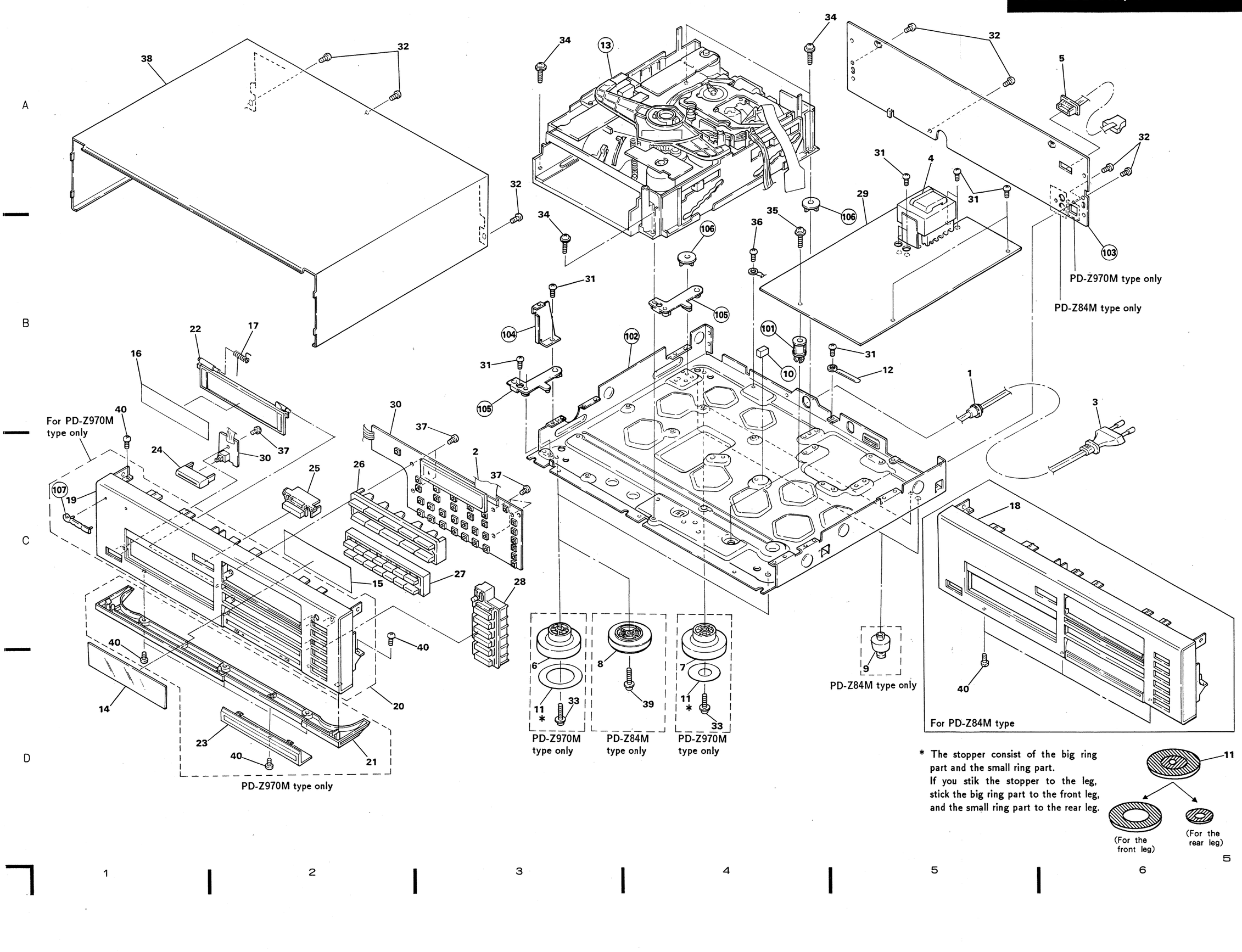
NOTES :

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation. This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

2.1 EXTERIOR SECTION

Mark	No.	Part No.	Description
⚠	1	CM-22B	Strain relief
	2	PDD1067	Flexible cable
⚠	3	PDG1008	AC power cord
⚠	4	PTT1125	Power transformer(AC 220/240V)
	5	PDE1067	Connection cable(For PD-Z84M)
	5	PDE1114	Connection cable(For PD-Z970M)
	6	PNW1573	Insulator assembly
	7	PNW1574	Insulator assembly
	8	PXA1343	Insulator assembly
	9	PXA1201	Leg assembly
	10		Cusion
	11	PNM1070	Stopper
	12	RNH-184	Cord clamper
	13		Multi mechanism assembly
	14	PAM1458	Display window(For PD-Z84M)
	14	PAM1456	Display window (Acryl) (For PD-Z970M)
	15	PAM1457	Display screen
	16	PAM1461	Door name plate(For PD-Z84M)
	16	PAM1460	Door name plate(For PD-Z970M)
	17	PBH1022	Door spring
	18	PNW1889	Function panel
	19	PNW1888	Function panel
	20	PEA1127	Function panel assembly
	21	PNW1891	Under panel
	22	PNW1894	Door(BK)(For PD-Z84M)
	22	PNW1892	Door(GR)(For PD-Z970M)
	23	PNW1906	Panel nameplate
	24	PAC1523	Power button(For PD-Z84M)
	24	PAC1526	Power button(For PD-Z970M)
	25	PAC1533	EJECT button(For PD-Z84M)
	25	PAC1532	EJECT button(For PD-Z970M)
	26	PAC1535	Function button(For PD-Z84M)
	26	PAC1534	Function button(For PD-Z970M)
	27	PAC1536	Track button
	28	PAC1538	Disc button(For PD-Z84M)
	28	PAC1537	Disc button(For PD-Z970M)
◉	29	PWM1370	Mother board assembly (For PD-Z84M)
◉	29	PWM1368	Mother board assembly (For PD-Z970M)
◉	30	PWX1147	Sub board aseembly (For PD-Z84M)
◉	30	PWX1146	Sub board aseembly (For PD-Z970M)
	31	BBZ30P060FMC	Screw
	32	BBZ30P080FCC	Screw
	33	IBZ30P200FCC	Screw
	34	IBZ30P135FMC	Screw
	35	IBZ30P150FCC	Screw
	36	PDZ30P050FMC	Screw
	37	PPZ30P100FMC	Screw
	38	PYY1146	Bonnet
	39	IBZ30P100FCC	Screw
	40	BBZ30P080FCC	Screw (For PD-Z970M)
	40	BBZ30P080FZK	Screw(For PD-Z84M)
	101		PCB Spacer
	102		Under base
	103		Rear panel
	104		Angle
	105		Mechanism base (A)
	106		Mechanism base (B)
	107		PIONEER badge





* The stopper consist of the big ring part and the small ring part.
If you stik the stopper to the leg, stick the big ring part to the front leg, and the small ring part to the rear leg.

NOTES:

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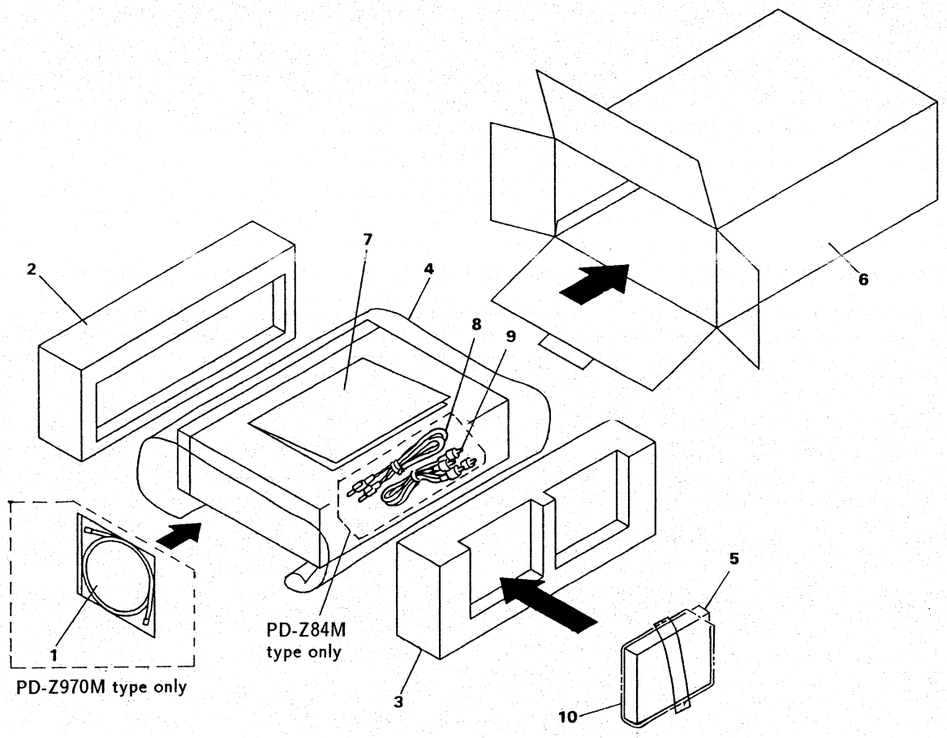
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

2.3 PACKING

Mark	No.	Part No.	Description
	1	AXX1031	Optical cable
	2	PHA1151	Protector F (For PD-Z970M)
	2	PHA1153	Protector F (For PD-Z84M)
	3	PHA1152	Protector R (For PD-Z970M)
	3	PHA1154	Protector R (For PD-Z84M)
	4	Z23-022	Mirror mat
	5	PXA1308	Magazine assembly
	6	PHG1593	CD packing case (For PD-Z970M)
	6	PHG1594	CD packing case
	7	PRE1137	Operating instructions (English/French/Dutch/Italian/German Swedish/Spanish/Portgauess) (For PD-Z970M)
	7	PRE1138	Operating instructions (English/French/Dutch/Italian/German Swedish/Spanish/Portgauess) (For PD-Z84M)
	8	PDE-319	Connection cord with mini plug
	9	PDE1065	Connection cord with pin plug
	10	PYY1141	PP case



3. LINE VOLTAGE SELECTION (For HEM, HB, HPW types)

LINE VOLTAGE SELECTION

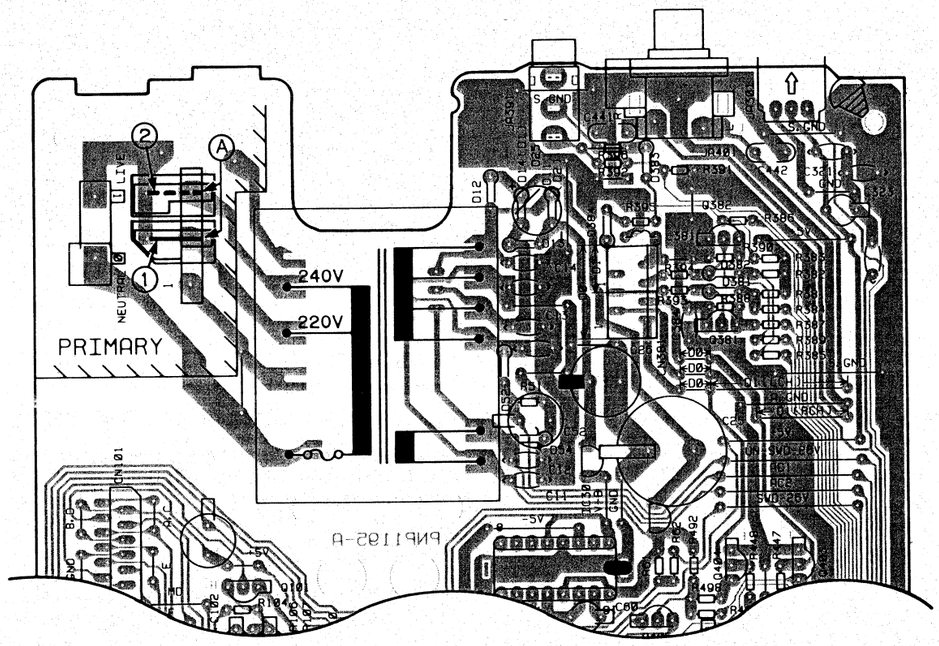
Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the bonnet.
3. Change the position of the jumper Ⓐ as follows.
   (Refer to the Mother board assembly.)

Voltage	Jumper Ⓐ position
220V	①
240V	②

4. Stick the line voltage label on the rear panel.

Part No.	Description
AAX-193	220V label
AAX-192	240V label

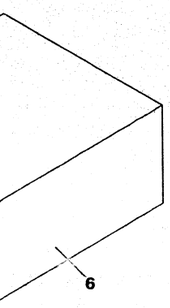


MOTHER BOARD ASSEMBLY

instructions (English/
tch/Italian/German
panish/Portgauess)
970M)

instructions (English/
tch/Italian/German
panish/Portgauess)
84M)

cord with mini plug
cord with pin plug



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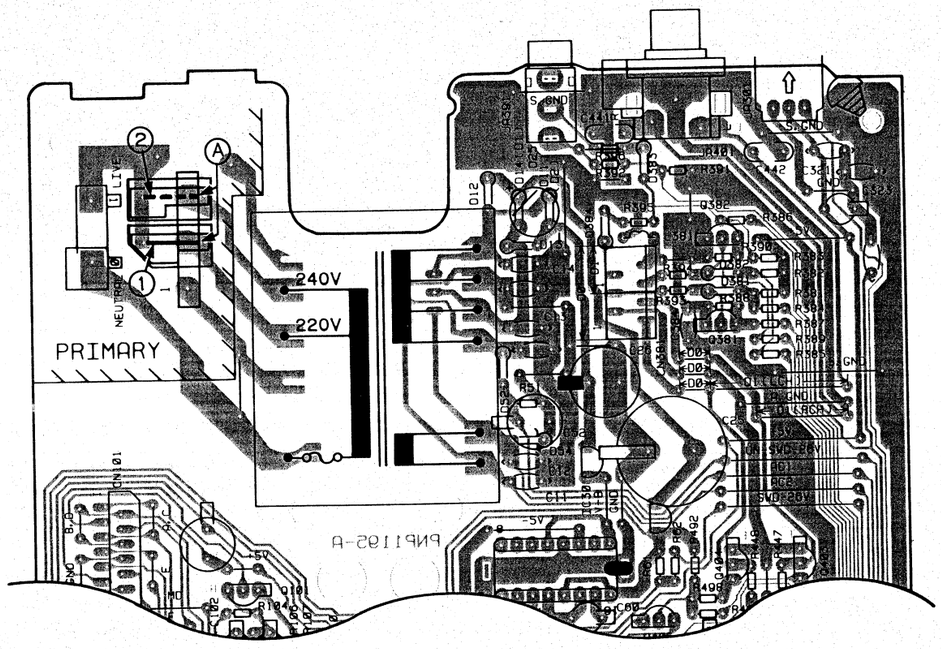
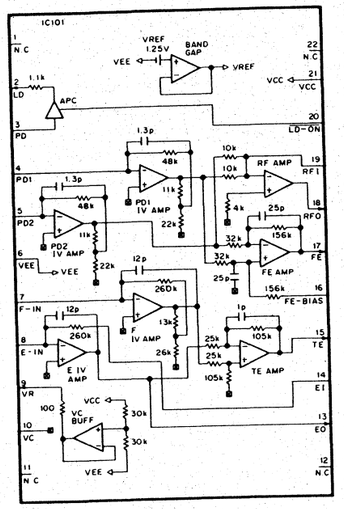


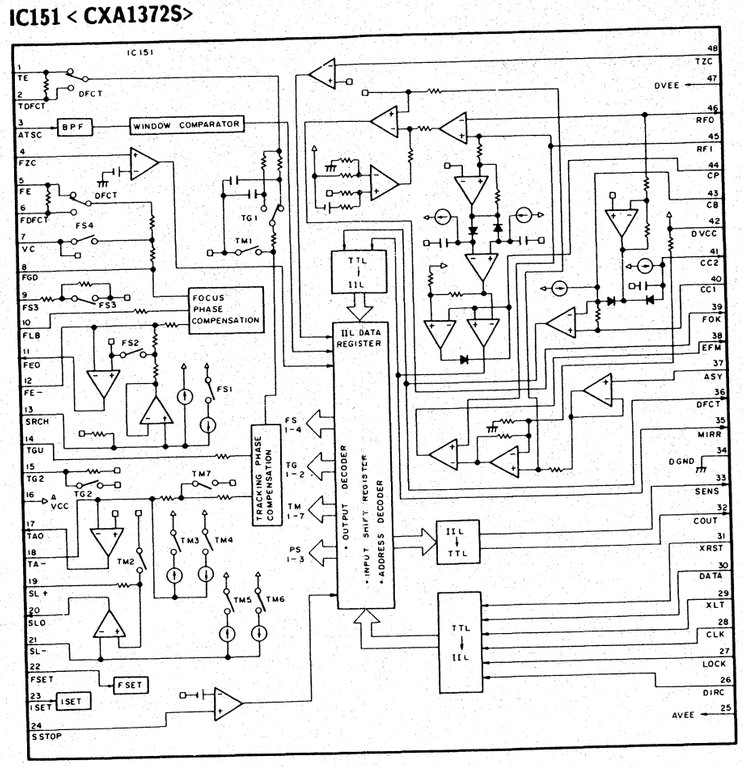
MOTHER BOARD ASSEMBLY

● IC BLOCK DIAGRAM

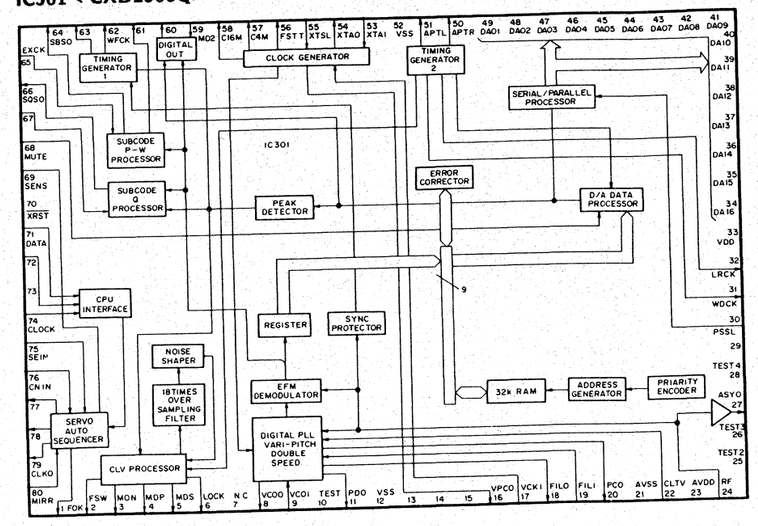
IC101 < CXA1471S>



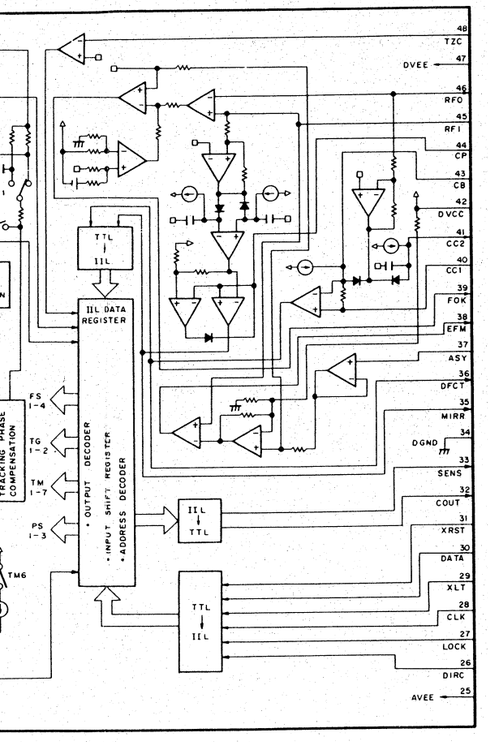
IC151 < CXA1372S>



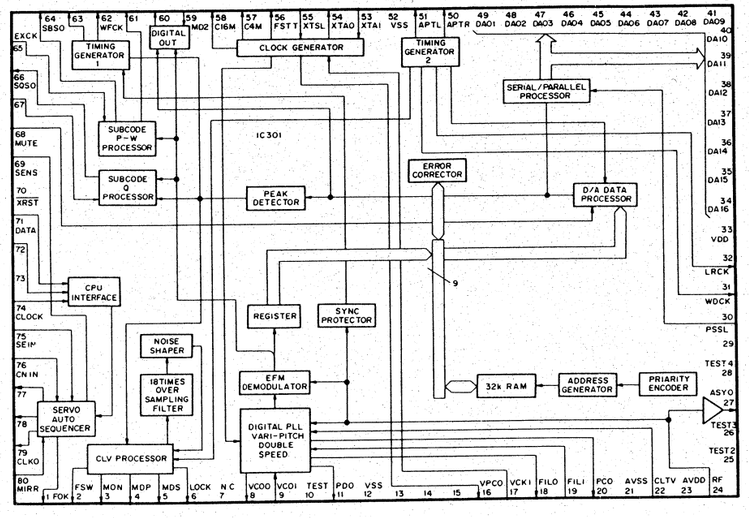
IC301 < CXD2500Q>



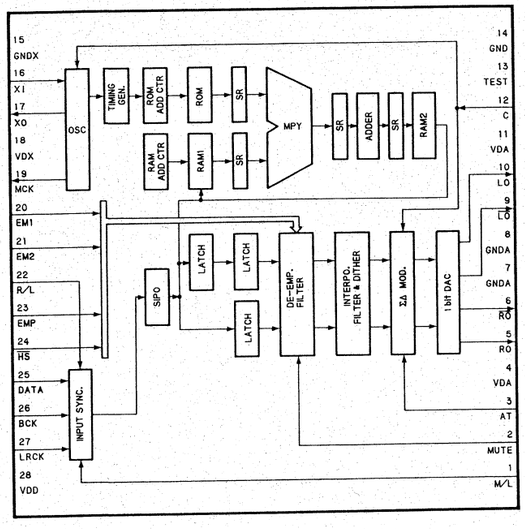
PD-284M, PD-297QM



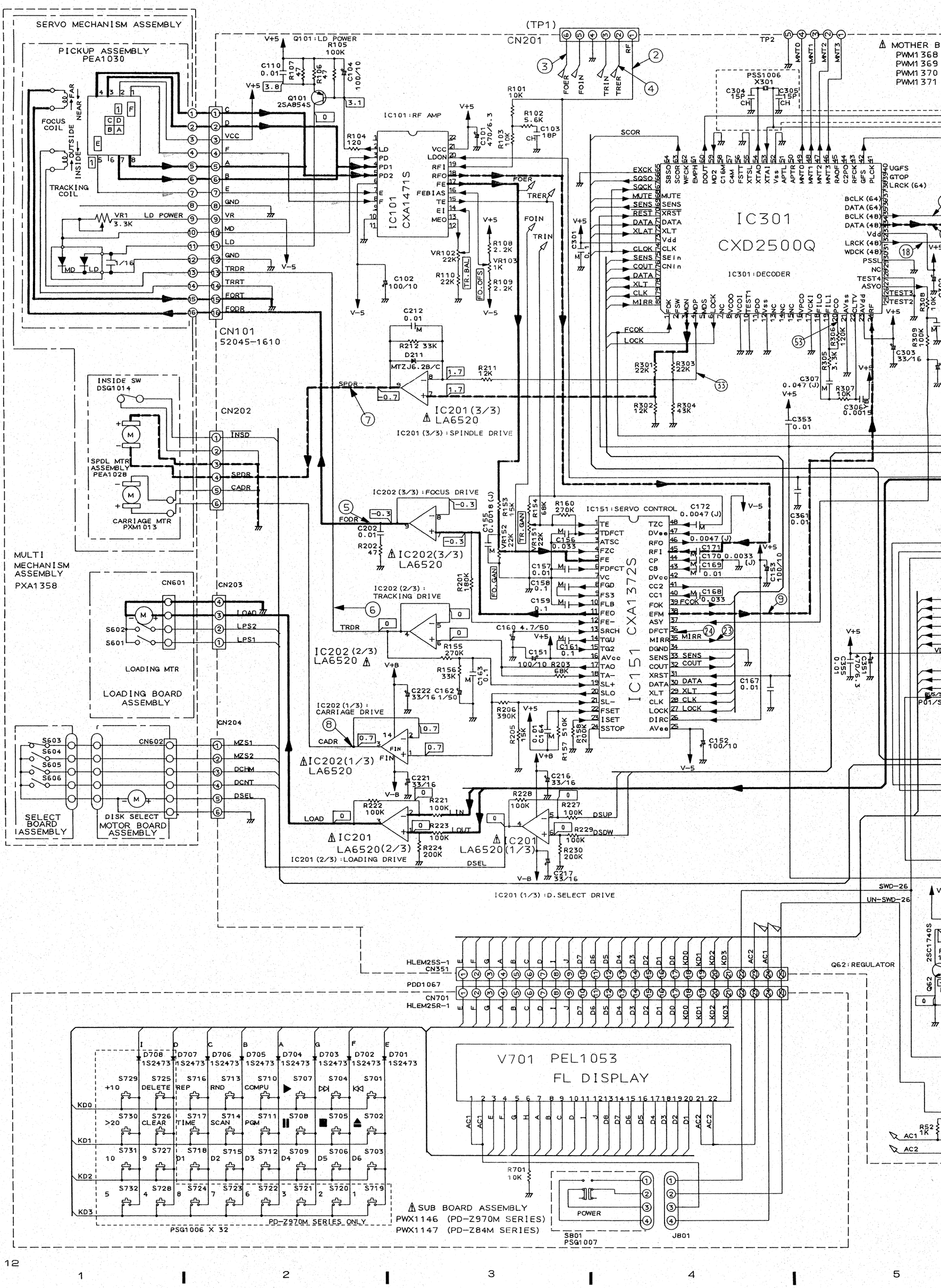
IC301 < CXD2500Q>



IC401 < TC9237N>



4. SCHEMATIC DIAGRAM



THER BOARD ASSEMBLY
M1368 (PD-Z970M/HEM AND HB)
M1369 (PD-Z970M/SD)
M1370 (PD-Z84M/HEM, HB AND HPW)
M1371 (PD-Z84M/SD)

PD-Z970M SERIES ONLY

IC401: D/A CONVERTER & DIGITAL FILTER

IC401 TC9237N

IC404(1/2) NJM4558D-D

IC404(2/2) NJM4558D-D

IC404 (1/2), (2/2): LOW PASS FILTER

Q403, 404: MUTING

Q403 2SD2144S

Q404 2SD2144S

JA401

X401 PSS1006

PD-Z84M SERIES ONLY

Q406 DTA124

Q406: INVERTER BUFFER

Q405 DTC124

Q405: INVERTER BUFFER

Q381: BUFFER

Q382: BUFFER

2SC1740S

IC351 PD4315A

IC151: SYSTEM CONTROL

CN381 KPE4

TO AMP
(PDE1114 (PD-Z970M SERIES))
(PDE1067 (PD-Z84M SERIES))

PD-Z970M SERIES ONLY

PD-Z84M SERIES ONLY

:Focus servo loop
:Signal route
:Tracking servo loop
:Carriage servo loop
:Disc select motor route
:Laoding motor route
:Spindle motor route

IC20: SYSTEM RESET & ±5V REGULATOR

IC20 M5298P

IC30 ICP-N10

IC30: OVER LOAD PROTECTOR

HEM: PDG1008
HB : PDG1021
HPW: PDG1011

PTT1125

POWER SUPPLY SECTION FOR PD-Z84M/HEM, HB, HPW, PD-Z970M/HEM, HB TYPES

RDG1003

PSB1002

PTT1126

POWER SUPPLY SECTION FOR PD-Z84M/SD, PD-Z970M/SD TYPES

	D54
PD-Z84M SERIES	MTZJ16B/C
PD-Z970M SERIES	MTZJ18B/C

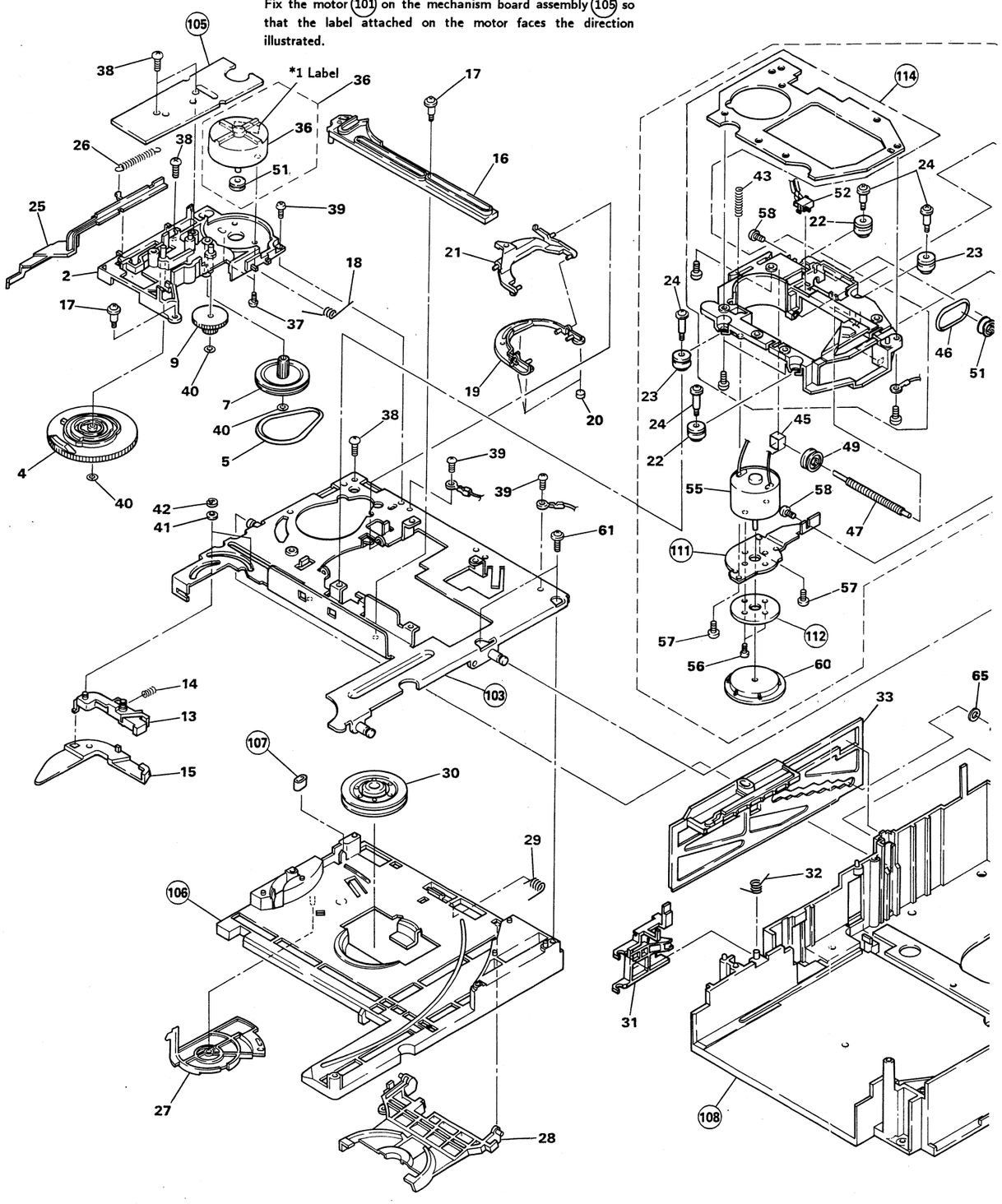
NOTES :

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

2.2 MECHANISM SECTION

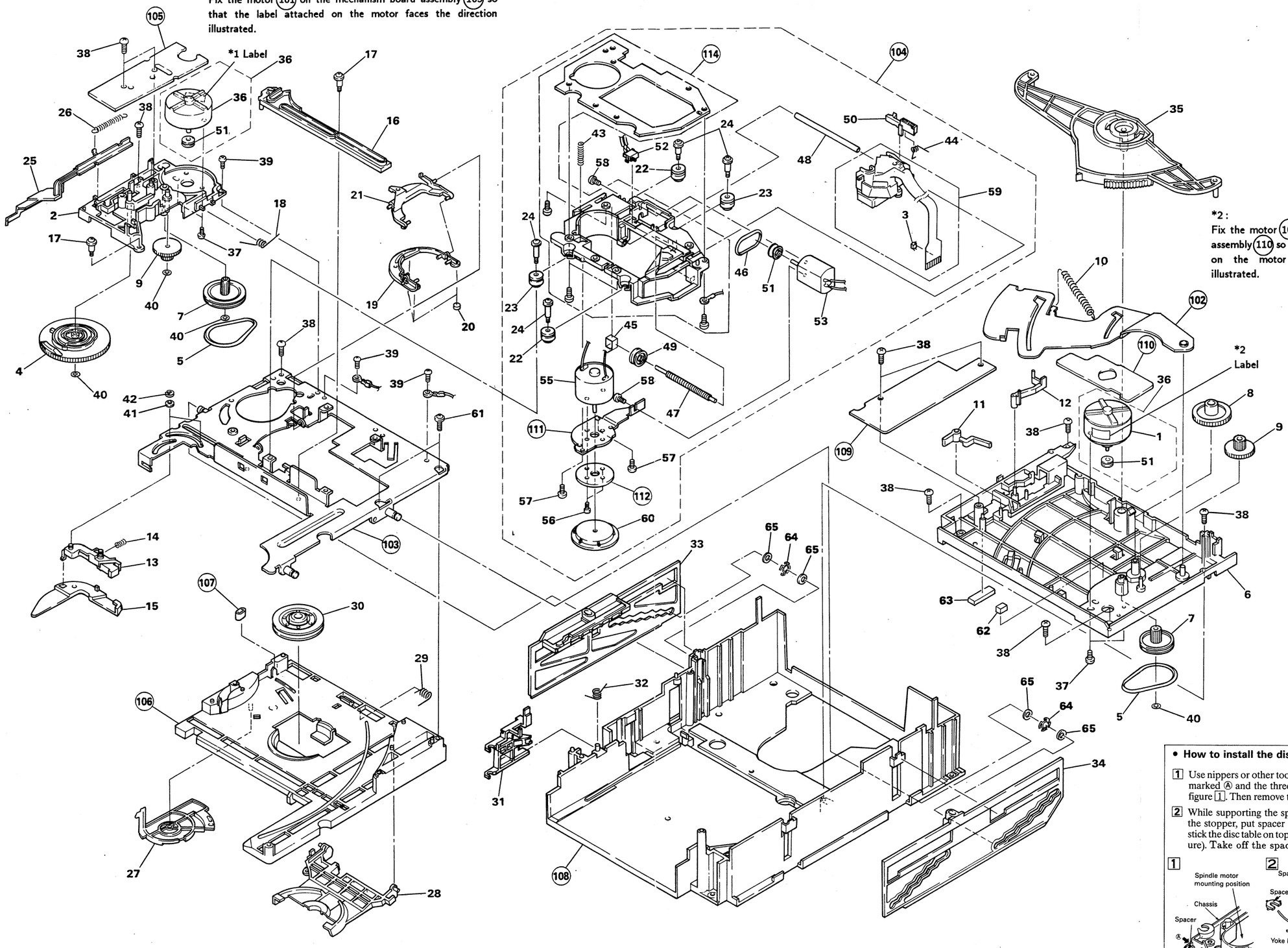
Mark	No.	Part No.	Description
	1	PEA1130	Motor assembly(select)
	2	PNW1929	Gear holder
	3	PCP1008	Potentiometer
	4	PNW1923	Cam gear
	5	PEB1138	Belt
	6	PNW1914	Top guide
	7	PNW1918	Gear pulley
	8	PNW1919	Gear(S)
	9	PNW1920	Gear(L)
	10	PBH1107	Eject spring
	11	PNW1927	Switch lever
	12	PNW1931	Seven bar
	13	PNW1933	Sub rotary lever
	14	PBH1111	Sub rotary lever spring
	15	PNW1932	Rotary lever
	16	PNW1930	Drive plate
	17	PBA-112	Screw
	18	PBH1110	Holder lever spring
	19	PNW1924	Disk holder
	20	PED1001	Cusion(A)
	21	PNW1925	Holder lever
	22	PEB1014	Float rubber
	23	PEB1132	Float rubber
	24	PBA1055	Float screw
	25	PNW1934	Release lever
	26	PBH1106	Release spring
	27	PNW1922	Clamper cam
	28	PNW1921	Clamper holder
	29	PBH1109	Clamper spring
	30	PNW1857	Clamper
	31	PNW1917	Lock lever
	32	PBH1108	Lock spring
	33	PNW1915	Stair(L)
	34	PNW1916	Stair(R)
	35	PNW1926	Synchronize lever
	36	PEA1130	Motor assembly(Loading)
	37	PMZ26P040FMC	Screw
	38	PPZ30P080FMC	Screw
	39	BBZ30P060FMC	Screw
	40	WT26D047D025	Washer
	41	WA31D054D025	Washer
	42	YE25FUC	E ring
	43	PBH1009	Earth spring
	44	PBH1084	Drive spring
	45	PBK1057	Plate spring
	46	PEB1072	Belt
	47	PLA1003	Drive screw
	48	PLA1071	Guide bar
	49	PNW1066	Pulley
	50	PNW1605	Half nut
	51	PNW1634	Motor pulley
	52	DSG1014	Slide switch
	53	PXM1013	DC motor / 1.7W(carriage)
	54	PBZ30P080FMC	Screw
	55	PEA1028	DC motor assembly(spindle)
	56	JFZ20P040FMC	Screw
	57	BPZ20P080FZK	Screw
	58	PMZ20P030FMC	Screw
	59	PEA1030	Pick up assembly
	60	PEA1035	Disc table
	61	IPZ30P080FMC	Scerw
	62	PEB1178	Spacer
	63	PEB1179	Spacer
	64	PBK1093	Plate spring
	65	WA62D130D025	Washer
	101		Motor
	102		Eject lever
	103		Upper chassis
	104		Servo mechanism assembly
	105		Mechanism board assembly
	106		Sub chassis
	107		Rubber tube
	108		Main chassis
	109		Select board assembly
	110		Motor board assembly
	111		Motor base
	112		York(M)
	113		Disc table
	114		Mechanism assembly T
	115		Mechanism chassis
	116		Table ring

*1 :
Fix the motor (101) on the mechanism board assembly (105) so that the label attached on the motor faces the direction illustrated.



*1 :
Fix the motor (101) on the mechanism board assembly (105) so that the label attached on the motor faces the direction illustrated.

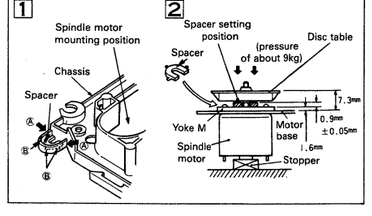
*2 :
Fix the motor (101) on the motor board assembly (110) so that the label attached on the motor faces the direction illustrated.



- **How to install the disc table**

1 Use nippers or other tool to cut the two sections marked Ⓐ and the three sections marked Ⓑ in figure 1. Then remove the spacer.

2 While supporting the spindle motor shaft with the stopper, put spacer on top of yoke M, and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



1.RESISTORS :
Indicated in Ω, 1/4W, 1/6W and 1/8W, ±5% tolerance unless otherwise noted k ; kΩ, M ; MΩ, (F) ; ±1%, (G) ; ±2%, (K) ; ±10%, (M) ; ±20% tolerance.

2.CAPACITORS :
Indicated in capacity (μF)/voltage(V) unless otherwise noted p ; pF. Indeication without voltage is 50V except electrolytic capacitor.

3.VOLTAGE, CURRENT :
⌜ ⌟ ; DC voltage (V) at no input signal.
⇦mA ; DC current at no input signal.
Value in ( ) is DC voltage at rated power.

4.OTHERS :
➡ ; Signal route.
⊘ ; Adjusting point
The ⚠ mark found on some component parts indicates the inportance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

●TERMINAL VOLTAGES

IC101 (CXA1471S)

Pin No.	Voltage	Pin No.	Voltage
1	N. C	12	N. C
2	2. 9	13	−0. 9
3	−4. 7	14	−0. 7
4	0	15	0
5	0	16	0
6	−5	17	0
7	0	18	0. 8
8	0	19	0
9	N. C	20	5
10	0	21	5
11	N. C	22	N. C

IC151 (CXA1372S)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	0	17	0	33	5
2	0	18	0	34	0
3	0	19	0	35	0
4	0	20	0.2~0.8	36	N. C
5	0	21	0	37	2. 5
6	0	22	−4	38	2. 5
7	0	23	1. 3	39	5
8	0	24	0	40	−1. 5
9	0	25	−5	41	−1. 7
10	0	26	5	42	5
11	−1	27	5	43	−0. 7
12	0	28	5	44	−1. 6
13	0. 2	29	5	45	0
14	0	30	5	46	0. 8
15	0	31	5	47	−5
16	5	32	0	48	0

IC301 (CXD2500Q)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5	21	0	41	N. C	61	N. C
2	N. C	22	2. 5	42	5	62	N. C
3	5	23	5	43	N. C	63	0
4	2. 6	24	2. 5	44	N. C	64	N. C
5	N. C	25	N. C	45	N. C	65	0
6	5	26	0	46	4. 4	66	3.3~4.6
7	N. C	27	2. 5	47	0	67	5
8	N. C	28	0	48	0	68	0
9	0	29	N. C	49	0 ~0.3	69	2.1~3
10	0	30	0	50	N. C	70	5
11	N. C	31	N. C	51	N. C	71	5
12	0	32	2. 5	52	0	72	5
13	N. C	33	5	53	2. 5	73	5
14	N. C	34	2. 5	54	N. C	74	5
15	N. C	35	2. 5	55	0	75	5
16	N. C	36	N. C	56	N. C	76	0
17	0	37	N. C	57	N. C	77	5
18	2. 5	38	N. C	58	N. C	78	5
19	2. 4	39	N. C	59	0	79	5
20	2. 4	40	N. C	60	N. C	80	0

IC401 (TC9237N)

Pin No.	Voltage	Pin No.	Voltage
1	5	15	0
2	0	16	1. 9
3	5	17	1. 9
4	5. 5	18	5
5	2. 5	19	2
6	2. 5	20	0
7	0	21	0
8	0	22	0
9	2. 5	23	0
10	2. 5	24	5
11	5	25	2. 5
12	0	26	2. 5
13	N. C	27	2. 5
14	0	28	5

PD-Z84M only

IC351 (PD4315A)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5	17	N. C	33	5	49	0
2	−23	18	−26	34	3.3~4.6	50	0
3	−23	19	−5	35	4. 4	51	0
4	−23	20	−10	36	0	52	0
5	−23	21	−7. 5	37	5	53	5
6	−23	22	−6. 5	38	2. 5	54	5
7	−23	23	−4	39	0	55	5
8	−23	24	−4	40	5	56	2. 2
9	−23	25	−9	41	N. C	57	2. 2
10	N. C	26	5	42	0	58	0
11	N. C	27	N. C	43	5	59	0
12	0	28	−13	44	0	60	N. C
13	0	29	−13	45	5	61	0
14	0	30	−13	46	0. 5	62	0
15	0	31	4	47	0	63	0
16	N. C	32	5	48	0	64	0

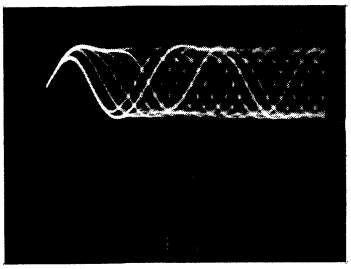
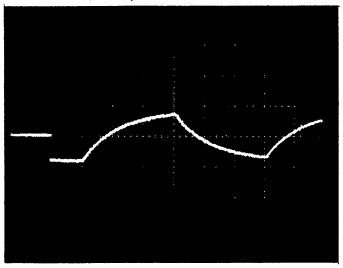
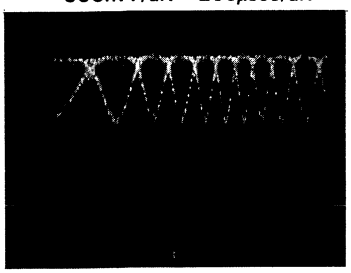
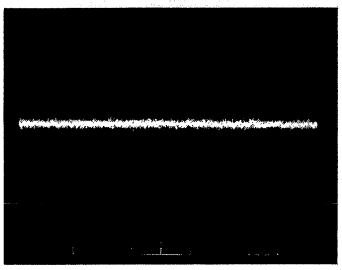
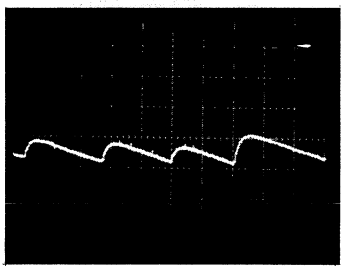
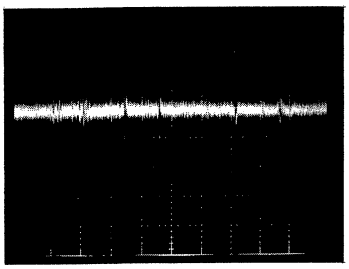
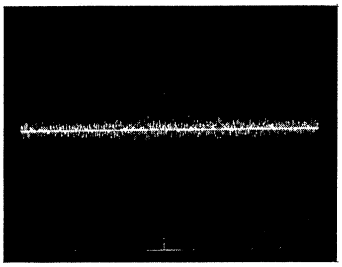
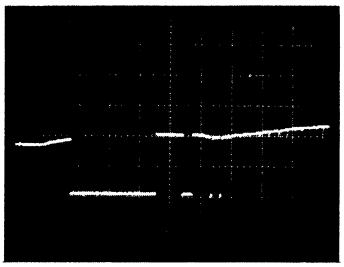
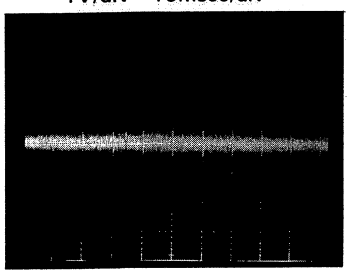
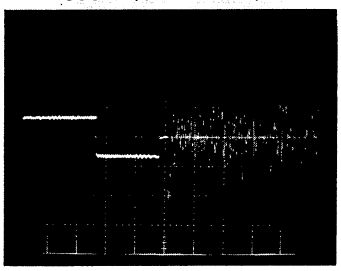
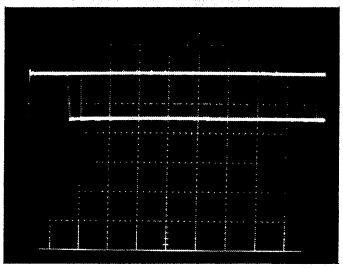
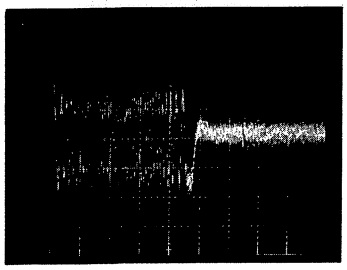
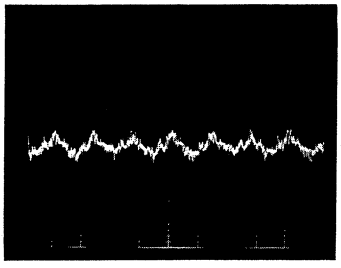
IC20 (M5298P)

Pin No.	Voltage
1	−8. 2
2	N. C
3	−5
4	0
5	−8. 2
6	N. C
7	N. C
8	N. C
9	5
10	N. C
11	0. 7
12	5
13	8
14	5
15	1. 2
16	8

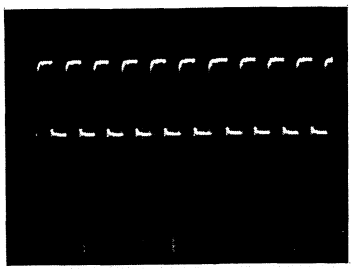
Waveforms

Note: The encircled numbers denote measuring points in the schematic diagram.

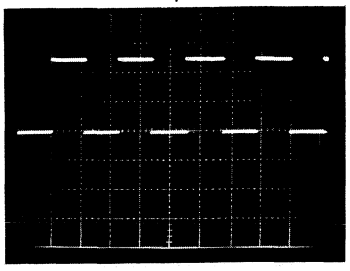
*1 50T-JUMP: After switching to the pause mode, press the manual search key.
*2 FOCUS-IN: Press the key without loading a disc.

② TP1-Pin 1: PLAY MODE (RF) 500mV/div 500nsec/div  – GND	⑤ IC202-Pin 9 : FOCUS-IN (*2) MODE (FODR) 1V/div 200msec/div  – GND	⑦ IC201-Pin 9: TRACK SEARCH MODE (SPDR) 2V/div 50msec/div – GND
② TP1-Pin 1: TRACK SEARCH MODE (RF) 500mV/div 200μsec/div  – GND	⑤ IC202-Pin 9 : PLAY MODE (FODR) 1V/div 1msec/div  – GND	⑧ IC202-Pin 3 : PLAY MODE (CADR) 1V/div 2S/div  – GND
③ TP1-Pin 6: PLAY MODE (FOER) 100mV/div 10msec/div  – GND	⑥ IC202-Pin 4 : PLAY MODE (TRDR) 500mV/div 1msec/div  – GND	⑧ IC202-Pin 3 : TRACK SEARCH MODE (CADR) 2V/div 200msec/div  – GND
④ TP1-Pin 2: PLAY MODE (TRER) 1V/div 10msec/div  – GND	⑥ IC202-Pin 4 : 50T-JUMP (*1) MODE (TRDR) 500mV/div 1msec/div  – GND	⑨ IC151-Pin 38: PLAY MODE (EFM) 2V/div 500nsec/div  – GND
④ TP1-Pin 2: 50T-JUMP (*1) MODE (TRER) 1V/div 1msec/div  – GND	⑦ IC201-Pin 9: PLAY MODE (SPDR) 1V/div 50msec/div  – GND	

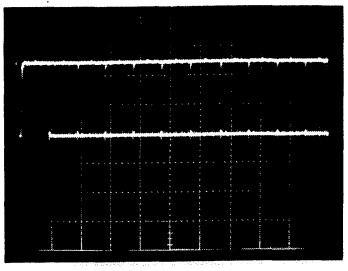
⑯ IC301-Pin 35: PLAY MODE (1kHz) (BCLK)
2V/div 500nsec/div



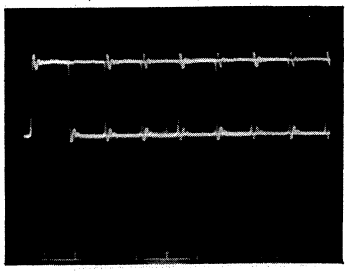
⑱ IC301-Pin 32: PLAY MODE (1kHz) (LRCK)
2V/div 10μsec/div



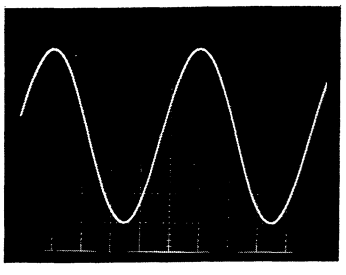
⑲ IC301-Pin 34: PLAY MODE (1kHz) (DATA)
2V/div 500nsec/div



⑳ IC401-Pin 9, Pin 10: (D/A OUT) PLAY MODE (1kHz)
2V/div 0.1μsec/div

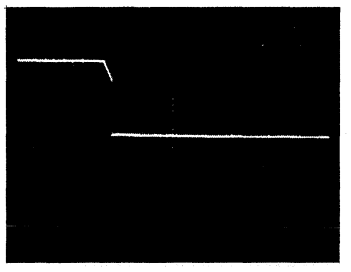


㉑ Pin -OUTPUT: PLAY MODE (1kHz)
1V/div 200μsec/div

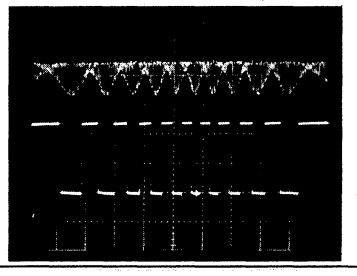


㉒ IC20-Pin 9: POWER SWITCH-ON (RST)
2V/div 100msec/div

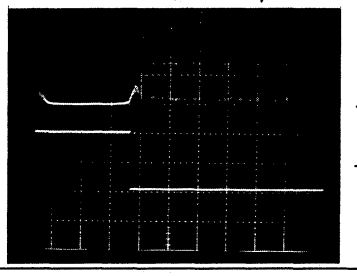
㉒ IC20-Pin 9: POWER SWITCH-OFF (RST)
2V/div 100msec/div



㉓ : TRACK SEARCH MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 35 (MIRR)
2V/div 200μsec/div



㉔ : PLAY MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 36 (DFCT)
5V/div 200μsec/div



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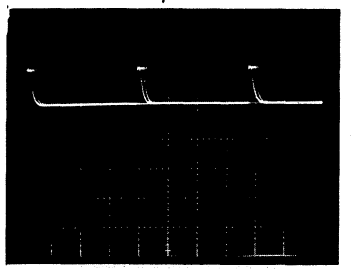
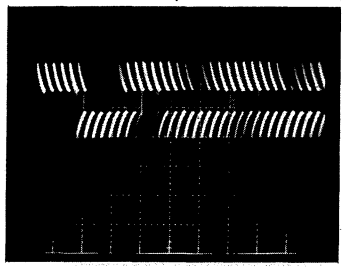
㉝ IC301-Pin 4: PLAY MODE (MDP)
2V/div 2μsec/div



㊸ IC301-Pin 20: PLAY MODE (PCO)
2V/div 10μsec/div



5. P.C.BOARDS CONNECTION DIAGRAM

SELECT BOARD ASSEMBLY

SERVO MECHANISM ASSEMBLY

PICKUP ASSEMBLY PEA1030

FOCUS COIL

FAR / NEAR

OUTSIDE / INSIDE

TRACKING COIL

VR1 LD POWER 3.3K

MD LD 1/16

INSIDE SW DSQ1014

SPDL MTR ASSEMBLY PEA1028

CARRIAGE MTR PXM1013

MOTOR BOARD ASSEMBLY

LOADING BOARD ASSEMBLY

POWER SUPPLY SECTION
For PD-Z84M/HEM,HB,HPW,
PD-Z970M/HEM,HB TYPES

HEM:PDG1008
HB :PDG1021
HPW:PDG1011

MOTHER BOARD ASSEMBLY
(PWM1368:PD-Z970M SERIES)
(PWM1370:PD-Z84M SERIES)

PRIMARY

240V

220V

IC151:CXA1372S

Pin No.	Voltage	Pin No.	Voltage
1	0	25	-5
2	0	26	5
3	0	27	5
4	0	28	5
5	0	29	5
6	0	30	5
7	0	31	5
8	0	32	0
9	0	33	5
10	0	34	0
11	-1	35	0
12	0	36	N.C
13	0.2	37	2.5
14	0	38	2.5
15	0	39	5
16	5	40	-1.5
17	0	41	-1.7
18	0	42	5
19	0	43	-0.7
20	0.2~0.8	44	-1.6
21	0	45	0
22	-4	46	0.8
23	1.3	47	-5
24	0	48	0

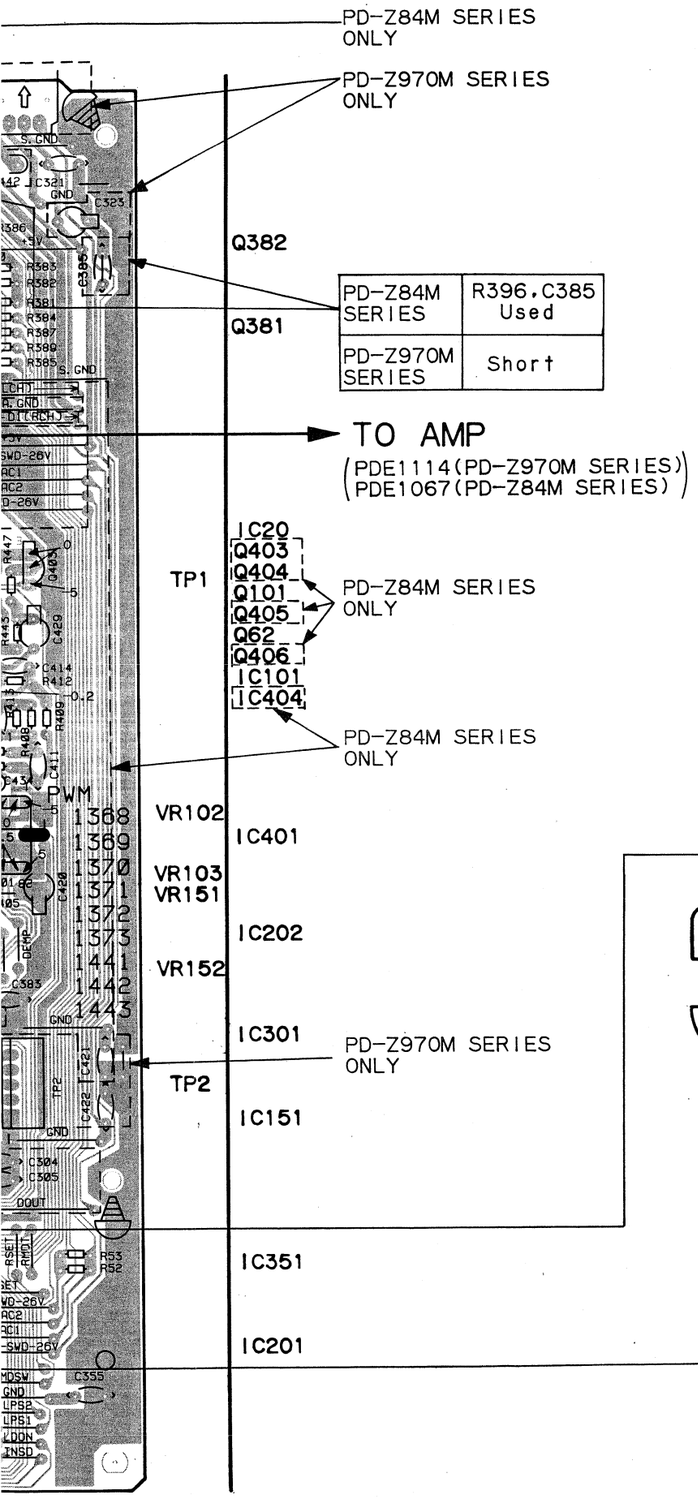
PD-Z970M SERIES ONLY

TP1

TP2

TEST

PWM
1368 VR102
1369
1370 VR103
1371 VR151
1440
1441 VR152
1442
1443

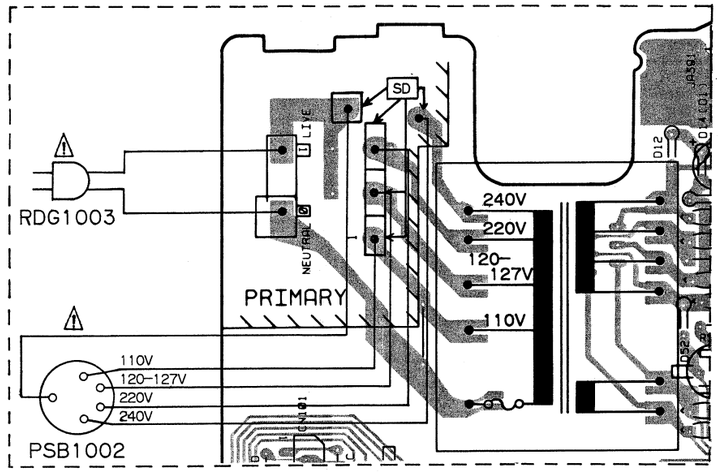


PD-Z84M SERIES	R396, C385 Used
PD-Z970M SERIES	Short

IC301 : CXD2500Q

Pin No.	Voltage	Pin No.	Voltage
1	5	41	N.C
2	N.C	42	5
3	5	43	N.C
4	2.6	44	N.C
5	N.C	45	N.C
6	5	46	4.4
7	N.C	47	0
8	N.C	48	0
9	0	49	0 ~0.3
10	0	50	N.C
11	N.C	51	N.C
12	0	52	0
13	N.C	53	2.5
14	N.C	54	N.C
15	N.C	55	0
16	N.C	56	N.C
17	0	57	N.C
18	2.5	58	N.C
19	2.4	59	0
20	2.4	60	N.C
21	0	61	N.C
22	2.5	62	N.C
23	5	63	0
24	2.5	64	N.C
25	N.C	65	0
26	0	66	3.3~4.6
27	2.5	67	5
28	0	68	0
29	N.C	69	2.1~3
30	0	70	5
31	N.C	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	5
36	N.C	76	0
37	N.C	77	5
38	N.C	78	5
39	N.C	79	5
40	N.C	80	0

POWER SUPPLY SECTION For
PD-Z84M/SD, PD-Z970M/SD TYPES

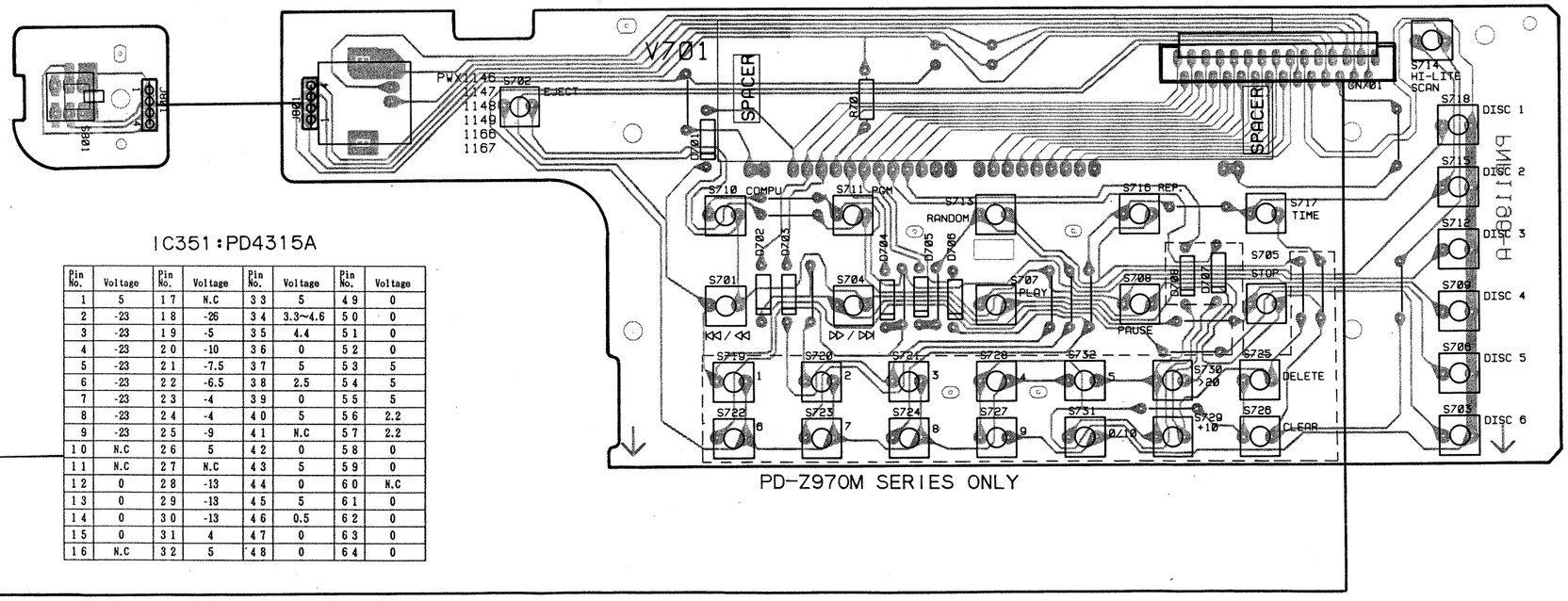


Note PD-Z84M SERIES : PD-Z84M/HEM, HB, HPW AND SD TYPES
PD-Z970M SERIES : PD-Z970M/HEM, HB AND SD TYPES

P.C.B. pattern diagram indication	Corresponding part symbol	Part name	P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor			Ceramic capacitor
		FET			Mylar capacitor
		Diode	SA		Styrol capacitor
			NP		Electrolytic capacitor (Non polarized)
			TN		Electrolytic capacitor (Noiseless)
		Zenner diode			Electrolytic capacitor (Polarized)
					Electrolytic capacitor (Polarized)
		LED			Power capacitor
		Varactor			Semi-fixed resistor
		Tact switch			Resistor array
					Resistor
		Inductor			
		Coil			Resonator
		Transformer			Thermistor
		Filter			

1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with O shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

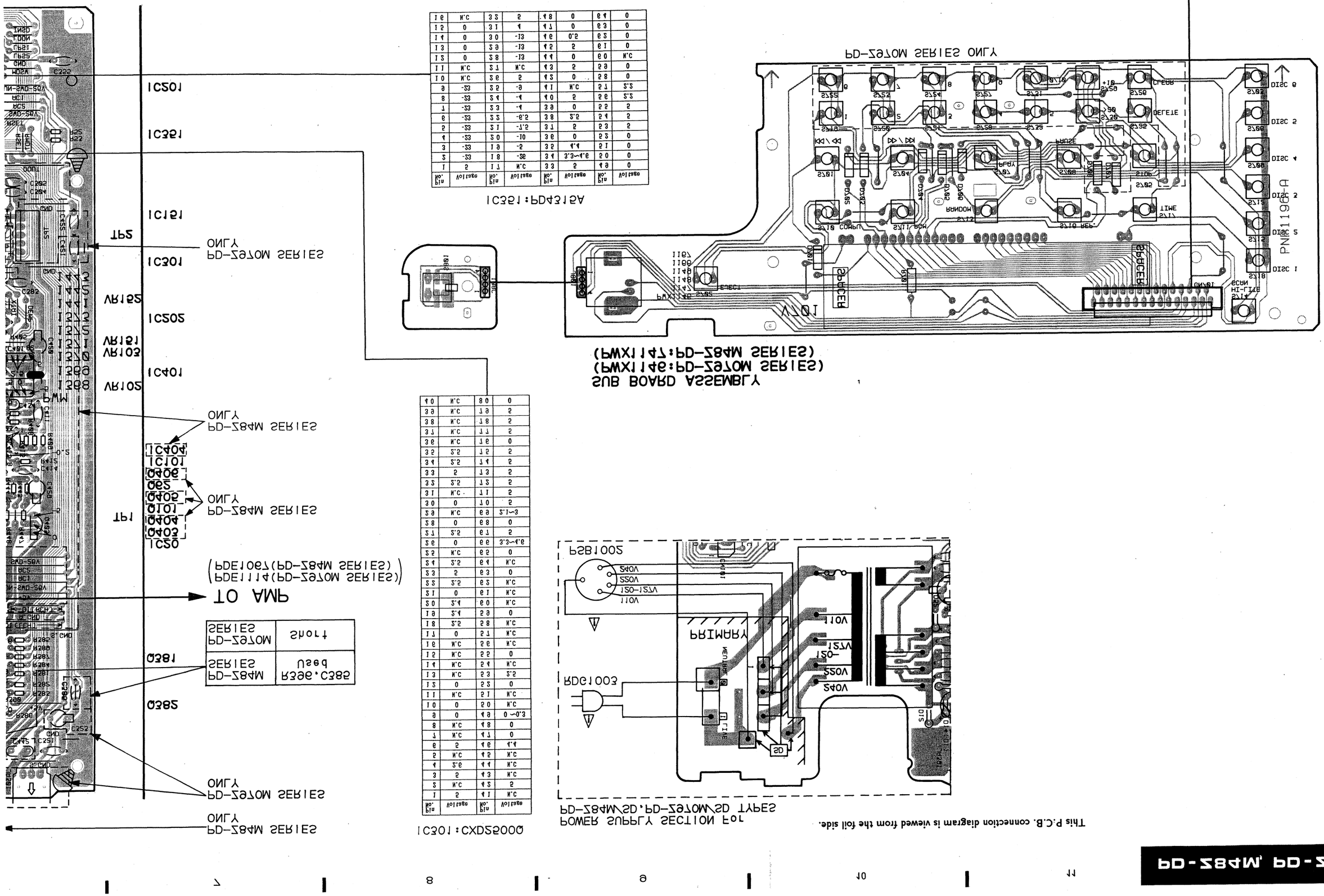
SUB BOARD ASSEMBLY
(PWX1146 : PD-Z970M SERIES)
(PWX1147 : PD-Z84M SERIES)



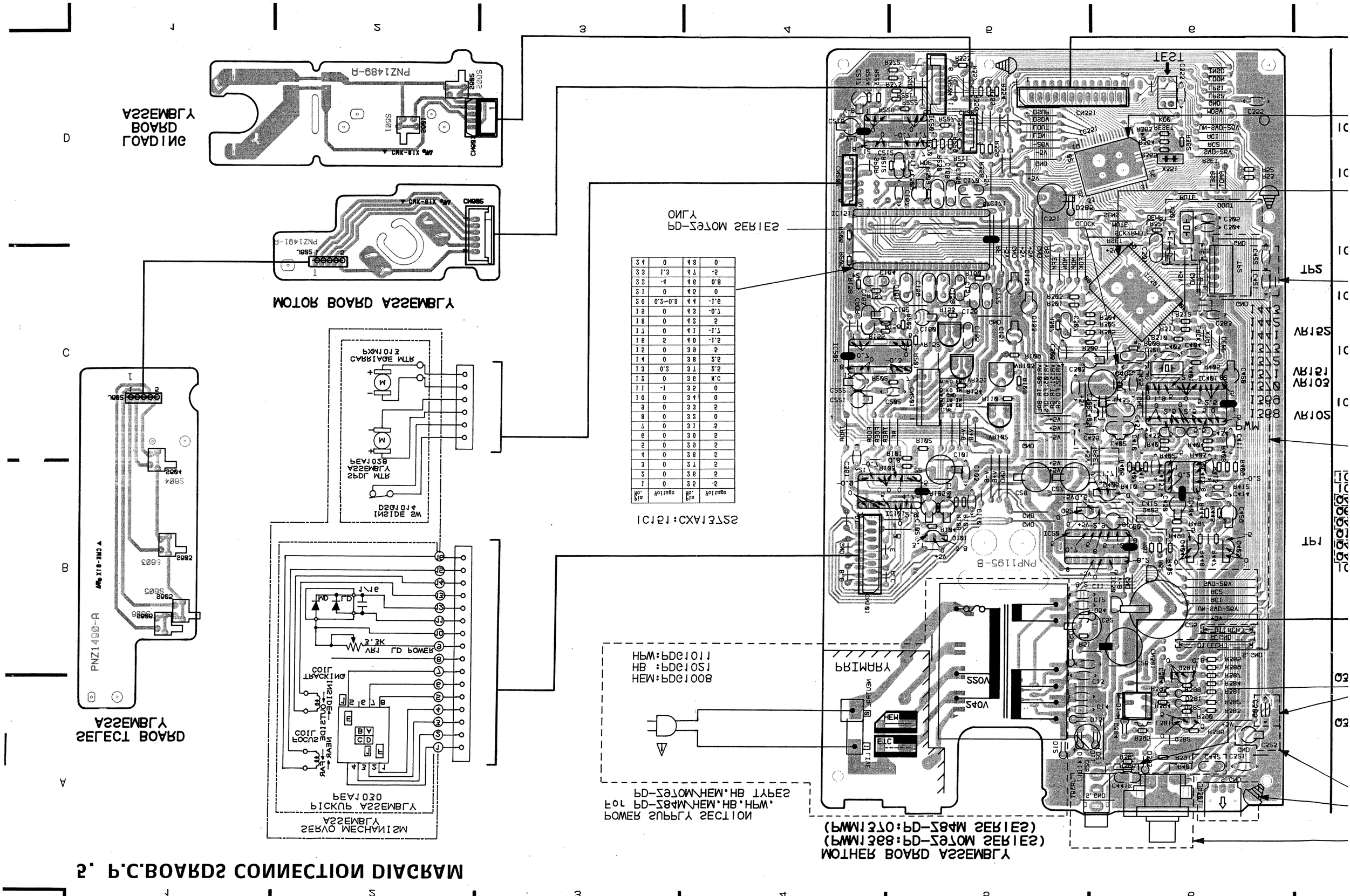
IC351 : PD4315A

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5	17	N.C	33	5	49	0
2	-23	18	-26	34	3.3~4.6	50	0
3	-23	19	-5	35	4.4	51	0
4	-23	20	-10	36	0	52	0
5	-23	21	-7.5	37	5	53	5
6	-23	22	-6.5	38	2.5	54	5
7	-23	23	-4	39	0	55	5
8	-23	24	-4	40	5	56	2.2
9	-23	25	-9	41	N.C	57	2.2
10	N.C	26	5	42	0	58	0
11	N.C	27	N.C	43	5	59	0
12	0	28	-13	44	0	60	N.C
13	0	29	-13	45	5	61	0
14	0	30	-13	46	0.5	62	0
15	0	31	4	47	0	63	0
16	N.C	32	5	48	0	64	0

PD-Z970M SERIES ONLY


CD-ROM SERVO UNIT
CD-ROM SERVO UNIT
CD-ROM SERVO UNIT

2. P.C.BOARDS CONNECTION DIAGRAM



6. P.C.B's PARTS LIST

NOTES :

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*

Ex.1 *When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).*

560Ω	*56 × 10¹*	*561*	..... *RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	..... *RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		..... *RD2H 0 R 5 K*
1Ω	*010*		..... *RD1P 0 1 0 K*

Ex.2 *When there are 3 effective digits (such as in high precision metal film resistors).*

5.62kΩ *562 × 10¹* *5621* ..... *RD1/4SR 5 6 2 1 F*

Mark	Symbol & Description	Part No.
	◉MOTHER BOARD ASSEMBLY(PWM1368) (For PD-Z970M)	
	SEMICONDUCTORS	
⚠	IC20 REGULATOR IC	M5298P
⚠	IC30 IC PROTECTOR	ICP-N10
	IC101 PRE AMP IC	CXA1471S
	IC151 SERVO IC	CXA1372S
⚠	IC201 POWER OP-AMP,IC	LA6520
⚠	IC202 POWER OP-AMP,IC	LA6520
	IC301 EFM DEMODULATION IC	CXD2500Q
	IC351 MICROCOMPUTER,IC	PD4315A
	Q62 TRANSISTOR	2SC1740S
	Q101 TRANSISTOR	2SA854S
	Q381 TRANSISTOR	2SC1740S
	Q382 TRANSISTOR	2SC1740S
⚠	D11-D14 DIODE	11ES2
⚠	D52 DIODE	11ES2
	D54 ZENNER DIODE	MTZJ18B/C
	D211 ZENNER DIODE	MTZJ6.2B/C
	D381-385 DIODE	1SS254
	COIL	
	L381 AXIAL INDUCTOR	LAU010K
	CAPACITORS	
	C11-C14 CERAMIC CAPACITOR	CKCYF103Z50
	C25 ELECTR.CAPACITOR	CEAS332M16
	C26 ELECTR.CAPACITOR	CEAS222M16
	C27 ELECTR.CAPACITOR	CEAS471M6R3
	C28 ELECTR.CAPACITOR	CEAS101M10
	C52 ELECTR.CAPACITOR	CEAS101M35
	C60 ELECTR.CAPACITOR	CEAS010M50
	C101 ELECTR.CAPACITOR	CEAS471M6R3
	C102 ELECTR.CAPACITOR	CEAS101M10
	C103 CERAMIC CAPACITOR	CCCCH180J50
	C104 ELECTR.CAPACITOR	CEAS101M10
	C110 CERAMIC CAPACITOR	CKCYF103Z50
	C151-C153 ELECTR.CAPACITOR	CEAS101M10
	C155 MYLOR FILM CAPACITOR	CQMA182J50
	C156 MYLOR FILM CAPACITOR	CQMA333K50
	C157 MYLOR FILM CAPACITOR	CQMA103K50
	C158,C159 MYLOR FILM CAPACITOR	CQMA104K50
	C160 ELECTR.CAPACITOR	CEAS4R7M50
	C161 MYLOR FILM CAPACITOR	CQMA104K50
	C162 ELECTR.CAPACITOR	CEAS010M50
	C163 MYLOR FILM CAPACITOR	CQMA104K50
	C164 MYLOR FILM CAPACITOR	CQMA103K50
	C167 CERAMIC CAPACITOR	CKCYF103Z50
	C168 MYLOR FILM CAPACITOR	CQMA333K50
	C169 MYLOR FILM CAPACITOR	CQMA103K50
	C170 MYLOR FILM CAPACITOR	CQMA332J50
	C171 MYLOR FILM CAPACITOR	CQMA472J50
	C172 MYLOR FILM CAPACITOR	CQMA472K50
	C202 CERAMIC CAPACITOR	CKCYF103Z50
	C212 MYLOR FILM CAPACITOR	CQMA103K50
	C216,C217,C221,C222 ELECTR.CAPACITOR	CEAS330M16
	C301 MYLOR FILM CAPACITOR	CQMA104K50
	C302 ELECTR.CAPACITOR	CEAS471M6R3
	C303 ELECTR.CAPACITOR	CEAS330M16
	C304,C305 CERAMIC CAPACITOR	CCCCH150J50
	C306 CERAMIC CAPACITOR	CKCYB152K50
	C307 MYLOR FILM CAPACITOR	CQMA473J50
	C308 MYLOR FILM CAPACITOR	CQMA103K50
	C309 ELECTR.CAPACITOR	CEASR47M50
	C321,C323 CERAMIC CAPACITOR	CKCYF103Z50
	C351 ELECTR.CAPACITOR	CEAS471M6R3
	C353,C355,C361,C384 CERAMIC CAPACITOR	CKCYF103Z50
	C422 CERAMIC CAPACITOR	CKCYF473Z50
	C401 CERAMIC CAPACITOR	CKCYF103Z50
	RESISTORS	
	R51-R53 CARBON FILM RESISTOR	RD1/6PM□□□J
	R61,R62 CARBON FILM RESISTOR	RD1/6PM□□□J
	R101-R110 CARBON FILM RESISTOR	RD1/6PM□□□J
	R153-R158 CARBON FILM RESISTOR	RD1/6PM□□□J
	R160 CARBON FILM RESISTOR	RD1/6PM□□□J
	R201-R203 CARBON FILM RESISTOR	RD1/6PM□□□J
	R205,R206 CARBON FILM RESISTOR	RD1/6PM□□□J
	R211,R212 CARBON FILM RESISTOR	RD1/6PM□□□J
	R221-R224 CARBON FILM RESISTOR	RD1/6PM□□□J
	R227-R230 CARBON FILM RESISTOR	RD1/6PM□□□J

Mark	Symbol & Description	Part No.
	R301-R309 CARBON FILM RESISTOR	RD1/6PM□□□J
	R321 CARBON FILM RESISTOR	RD1/6PM□□□J
	R353-R359 CARBON FILM RESISTOR	RD1/6PM□□□J
	R362-R365 CARBON FILM RESISTOR	RD1/6PM□□□J
	R370-R373 CARBON FILM RESISTOR	RD1/6PM□□□J
	R381-R395 CARBON FILM RESISTOR	RD1/6PM□□□J
	VR102 VR	RCP1046
	VR103 VR	RCP1044
	VR151 VR	RCP1046
	VR152 VR	RCP1046

OTHERS

	CN101 CONNECTOR 16P	52045-1610
	CN351 CONNECTOR	HLEM25S-1
	CN381 CONNECTOR 4P	KPE4
	JA301 OPTICAL OUTPUT JACK	TOTX178
	X301 XTAL RES (OSC)	PSS1006
	X351 CERAMIC RESONATOR	VSS1014

◉MOTHER BOARD ASSEMBLY(PWM1370) (For PD-Z84M)

SEMICONDUCTORS

⚠	IC20 REGULATOR IC	M5298P
⚠	IC30 IC PROTECTOR	ICP-N10
	IC101 PRE AMP IC	CXA1471S
	IC151 SERVO IC	CXA1372S
⚠	IC201 POWER OP-AMP,IC	LA6520
⚠	IC202 POWER OP-AMP,IC	LA6520
	IC301 EFM DEMODULATION IC	CXD2500Q
	IC351 MICROCOMPUTER,IC	PD4315A
	IC401 8FS DF DA IC	TC9237N
	IC404 OP-AMP IC	NJM4558D-D
	Q62 TRANSISTOR	2SC1740S
	Q101 TRANSISTOR	2SA854S
	Q381,Q382 TRANSISTOR	2SC1740S
	Q382 TRANSISTOR	2SC1740S
	Q403 TRANSISTOR	2SD2144S
	Q404 TRANSISTOR	2SD2144S
	Q405 TRANSISTOR	DTC124ES
	Q406 TRANSISTOR	DTA124ES
⚠	D11-D14 DIODE	11ES2
⚠	D52 DIODE	11ES2
	D54 ZENNER DIODE	MTZJ16B/C
	D211 ZENNER DIODE	MTZJ6.2B/C
	D381-D385 DIODE	1SS254

COILS

	L381 AXIAL INDUCTOR	LAU010K
	L401 AXIAL COIL	LAUR22K
	L402,L403 AXIAL INDUCTOR	LAU010K

CAPACITORS

	C11-C14 CERAMIC CAPACITOR	CKCYF103Z50
	C25 ELECTR.CAPACITOR	CEAS332M16
	C26 ELECTR.CAPACITOR	CEAS222M16
	C27 ELECTR.CAPACITOR	CEAS471M6R3
	C28 ELECTR.CAPACITOR	CEAS101M10
	C52 ELECTR.CAPACITOR	CEAS101M35
	C60 ELECTR.CAPACITOR	CEAS010M50
	C101 ELECTR.CAPACITOR	CEAS471M6R3
	C102 ELECTR.CAPACITOR	CEAS101M10
	C103 CERAMIC CAPACITOR	CCCCH180J50
	C104 ELECTR.CAPACITOR	CEAS101M10
	C110 CERAMIC CAPACITOR	CKCYF103Z50
	C151-C153 ELECTR.CAPACITOR	CEAS101M10
	C155 MYLOR FILM CAPACITOR	CQMA182J50
	C156 MYLOR FILM CAPACITOR	CQMA333K50
	C157 MYLOR FILM CAPACITOR	CQMA103K50
	C158,C159 MYLOR FILM CAPACITOR	CQMA104K50
	C160 ELECTR.CAPACITOR	CEAS4R7M50
	C161 MYLOR FILM CAPACITOR	CQMA104K50
	C162 ELECTR.CAPACITOR	CEAS010M50
	C163 MYLOR FILM CAPACITOR	CQMA104K50
	C164 MYLOR FILM CAPACITOR	CQMA103K50
	C167 CERAMIC CAPACITOR	CKCYF103Z50
	C168 MYLOR FILM CAPACITOR	CQMA333K50
	C169 MYLOR FILM CAPACITOR	CQMA103K50
	C170 MYLOR FILM CAPACITOR	CQMA332J50
	C171 MYLOR FILM CAPACITOR	CQMA472J50
	C172 MYLOR FILM CAPACITOR	CQMA472K50
	C202 CERAMIC CAPACITOR	CKCYF103Z50
	C212 MYLOR FILM CAPACITOR	CQMA103K50
	C216,C217,C221,C222 ELECTR.CAPACITOR	CEAS330M16
	C301 MYLOR FILM CAPACITOR	CQMA104K50
	C302 ELECTR.CAPACITOR	CEAS471M6R3
	C303 ELECTR.CAPACITOR	CEAS330M16
	C306 CERAMIC CAPACITOR	CKCYB152K50
	C307 MYLOR FILM CAPACITOR	CQMA473J50
	C308 MYLOR FILM CAPACITOR	CQMA103K50
	C309 ELECTR.CAPACITOR	CEASR47M50
	C321 CERAMIC CAPACITOR	CKCYF103Z50
	C351 ELECTR.CAPACITOR	CEAS471M6R3
	C353,C355,C361,C383-C385 CERAMIC CAPACITOR	CKCYF103Z50
	C403,C404 CERAMIC CAPACITOR	CCCCH470J50
	C410,C411 CERAMIC CAPACITOR	CCCSL560J50
	C412-C415 CERAMIC CAPACITOR	CCCCH390J50
	C420 MYLOR FILM CAPACITOR	CQMA104K50
	C421 CERAMIC CAPACITOR	CKCYF473Z50
	C429,C430 ELECTR.CAPACITOR	CEAS220M25
	C431,C432 MYLOR FILM CAPACITOR	CQMA104K50
	C433,C434 MYLOR FILM CAPACITOR	CQMA333K50
	C435 CERAMIC CAPACITOR	CKCYF473Z50
	C436 CERAMIC CAPACITOR	CKCYF103Z50
	C441,C442 MYLOR FILM CAPACITOR	CQMA152J50

RESISTORS

	R51-R53 CARBON FILM RESISTOR	RD1/6PM□□□J
	R61,R62 CARBON FILM RESISTOR	RD1/6PM□□□J
	R101-R110 CARBON FILM RESISTOR	RD1/6PM□□□J
	R153-R158 CARBON FILM RESISTOR	RD1/6PM□□□J
	R160 CARBON FILM RESISTOR	RD1/6PM□□□J
	R201-R203 CARBON FILM RESISTOR	RD1/6PM□□□J
	R205,R206 CARBON FILM RESISTOR	RD1/6PM□□□J
	R211,R212 CARBON FILM RESISTOR	RD1/6PM□□□J
	R221-R224 CARBON FILM RESISTOR	RD1/6PM□□□J
	R227-R230 CARBON FILM RESISTOR	RD1/6PM□□□J
	R301-R312 CARBON FILM RESISTOR	RD1/6PM□□□J
	R353-R359 CARBON FILM RESISTOR	RD1/6PM□□□J
	R362-R365 CARBON FILM RESISTOR	RD1/6PM□□□J
	R370-R373 CARBON FILM RESISTOR	RD1/6PM□□□J
	R381-R396 CARBON FILM RESISTOR	RD1/6PM□□□J

Mark	Symbol & Description	Part No.
	R401-R413 CARBON FILM RESISTOR	RD1/6PM□□□J
	R443,R444 CARBON FILM RESISTOR	RD1/6PM□□□J
	R447,R448 CARBON FILM RESISTOR	RD1/6PM□□□J
	R492 CARBON FILM RESISTOR	RD1/6PM□□□J
	R497,R498 CARBON FILM RESISTOR	RD1/6PM□□□J
	VR102 VR	RCP1046
	VR103 VR	RCP1044
	VR151 VR	RCP1046
	VR152 VR	RCP1046
	OTHERS	
	CN101 CONNECTOR	52045-1610
	CN351 CONNECTOR	HLEM25S-1
	CN381 CONNECTOR(4P)	KPE4
	JA391 JACK/12V	PKN1004
	JA401 JACK	PKB1009
	X351 CERAMIC RESONATOR	VSS1014
	X401 XTAL RES (OSC)	PSS1006

◉SUB BOARD ASSEMBLY(PWX1146) (For PD-Z970M)

	SEMICONDUCTORS	
	D701-D708 DIODE	1S2473
	SWITCHES	
	S701-S732 SWITCH	PSG1006
	S801 SWITCH	PSG1007
	RESISTOR	
	R701 CARBON FILM RESISTOR	RD1/4PM103J
	OTHERS	
	CN701 CONNECTOR	HLEM25R-1
	V701 FL INDICATOR TUBE	PEL1053

◉SUB BOARD ASSEMBLY(PWX1147) (For PD-Z84M)

	SEMICONDUCTORS	
	D701-D706 DIODE	1S2473
	SWITCHES	
	S701-S718 SWITCH	PSG1006
	S801 SWITCH	PSG1007
	RESISTOR	
	R701 CARBON FILM RESISTOR	RD1/4PM103J
	OTHERS	
	CN701 CONNECTOR	HLEM25R-1
	V701 FL INDICATOR TUBE	PEL1053

LOADING BOARD ASSEMBLY

	SWITCHES	
	S601, S602 SWITCH	DSG1016

SELECT BOARD ASSEMBLY

	SWITCHES	
	S603-S606 SWITCH	DSG1016

Mark	Symbol & Description	Part No.

MOTOR BOARD ASSEMBLY

No electrical parts are supplied this assembly.

7. ADJUSTMENTS

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pick up or the circuitry. Adjust correctly following the adjustment procedure.

7-1. Adjustment items/verification item and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP1, Pin 6(FCS.ERR)	VR103(FCS.OFS)
2	Grating adjustment	TP1, Pin 2(TRK.ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP1, Pin 2(TRK.ERR)	VR102(TRK. BAL)
4	Pick up radial/tangential direction tilt adjustment	TP1, Pin 1(RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment (RF level)	TP1, Pin 1(RF)	VR1(RF level)
6	Focus servo loop gain adjustment	TP1, Pin 5(FCS.IN) TP1, Pin6(FCS.ERR)	VR152(FCS.GAN)
7	Tracking servo loop gain adjustment	TP1, Pin 3(TRK.IN) TP1, Pin 2(TRK.ERR)	VR151(TRK.GAN)
8	Focus error signal verification	TP1, Pin 6(FCS.ERR)	—

- Abbreviation table
  - FCS.ERR : Focus Error
  - FCS.OFS : Focus Offset
  - TRK.ERR : Tracking Error
  - TRK.BAL : Tracking Balance
  - FCS.IN : Focus In
  - TRK.IN : Tracking In

7-2. Measuring instruments and tools

1. Dual trace oscilloscope (10 : 1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. Low-pass filter (39 kΩ+ 0.001μF)
5. Resistor (100 kΩ)
6. Standard tools

7-3. Test point and adjustment variable resistor positions

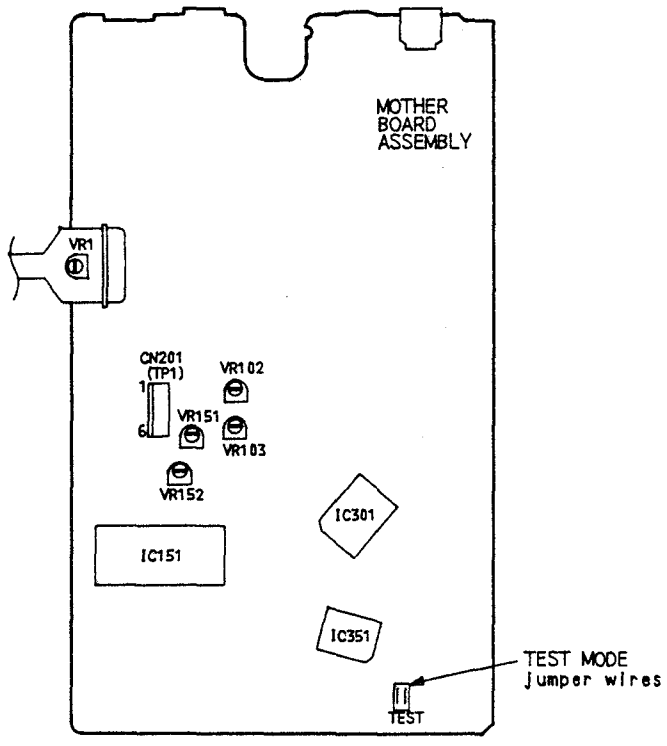


Figure 1 Adjustment Locations

7-4. Notes

1. Use a 10 : 1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10 : 1 probe is used.

7-5. Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.

1. Turn off the power switch.
2. Short the test mode jumper wires. (See Figure 1.)
3. Turn on the power switch.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1-3.

[Release from test mode]

Here is the procedure for releasing test mode :

1. Press the STOP key and stop all operations.
2. Turn off the power switch on the fromt panel.

[Operations of the keys in test mode]

Code	Key name	Function in test mode	Explanation
	PGM (PROGRAM)	Focus servo close	The laser diode is lit up and the focus actuator is lifted up, then lowered slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled up, then the actuator is lowered and raised twice and returned to its original position.
▷	PLAY	Spindle servo On	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost edge of the disc, the same symptom is occurred.
⏸	PAUSE	Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.

Code	Key name	Function in test mode	Explanation
⏮ ／ ⏮	TRACK/ MANUAL SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
⏭ ／ ⏭	TRACK/ MANUAL SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer diameter of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the motor does not automatically stop at the mechanical end point in test mode, be careful with this operation.
□	STOP	Stop	Initializes and the disc rotation stops. The pickup and disc remain where they are when this key is pressed.
⏏	EJECT	CD magazine eject	Stores Disc 1 in the CD magazine, then ejects the CD magazine. However, even though the CD magazine is ejected, the pickup does not return to the park position. Even if the CD magazine is mounted again, the pickup remains where it is.

Note : When inserting the magazine, disc 1 of the magazine is loaded automatically

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.
Here is the key operation sequence for playing back a disc in test mode.

PGM	Lights up the laser diode and closes the focus servo.
⇩	
PLAY ▷	Starts the spindle motor and closes the spindle servo.
⇩	
PAUSE ⏸	Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

1. Focus offset adjustment

● Objective	Sets the DC offset for the focus error amp.		
● Symptom when out of adjustment	The model does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) VR103 (FCS OFS) None needed

[Procedure]

Adjust VR103 (FCS OFS) so that the DC voltage at TP1, Pin 6 (FCS ERR) is −150±50 mV.

2. Grating adjustment

● Objective	To align the tracking error generation laser beam spots to the optimum angle on the track.		
● Symptom when out of adjustment	Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR) via a low pass filter. (See Figure 2) [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open. Pickup grating adjustment slit YEDS-7

[Procedure]

1. Move the pickup to the outer edge of the disc with the MANUAL SEARCH FWD ⏩ or ⏪ key so that the grating adjustment slit is at the outer edge of the disc where it can be adjusted.

   Note: For Multi-play CD type, use the TRACK/MANUAL SEARCH FWD ⏭/⏩ or ⏮/⏪ key to move the pickup to halfway across the disc (R = 35 mm).

2. Press the PGM key, then the PLAY ▷ key in that order to close the focus servo then the spindle servo.

3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.

4. If you slowly turn the screwdriver clockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again.
   Turn the screwdriver clockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

   Reference: Figure 3 shows the relation between the angle of the tracking beam with the track and the waveform.
   Note: The amplitude of the tracking error signal is about 3 Vp-p (when a 39 kΩ + 0.001 μF low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), then the objective lens may be dirty or the pickup malfunctioning. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.

5. Return the pickup to more or less midway across the disc with the TRACK/MANUAL SEARCH REV ⏮/⏪ key, press the PAUSE ⏸ key and double check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, double check the null point and adjust the grating again.

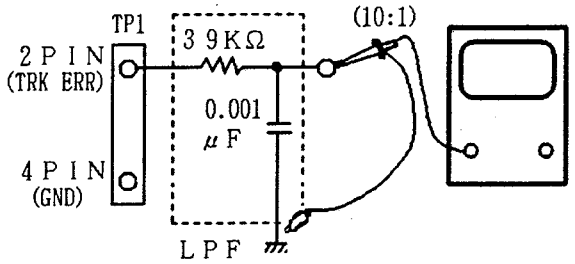
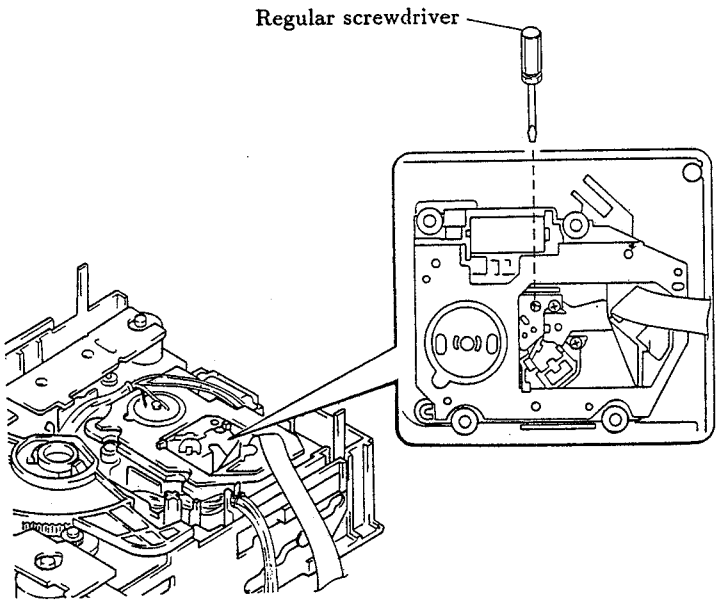


Figure 2



Adjustment Locations

[How to find the null point]

When you insert the regular screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1 Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which wave form is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)

This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

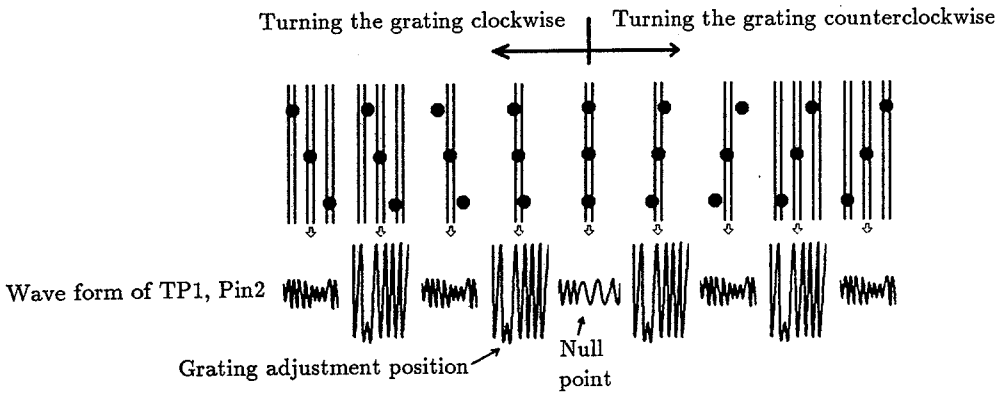
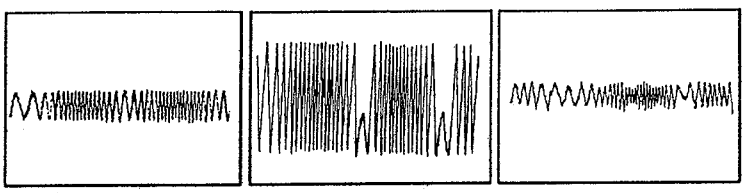


Figure 3



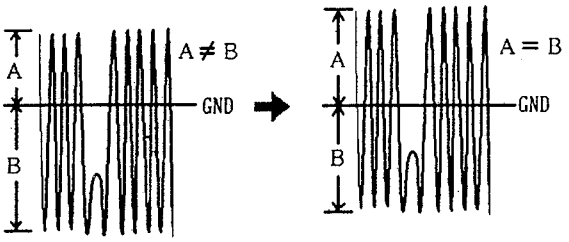
Null point wave form | Maximum amplitude wave form | Wave form other than the null point

3. Tracking error balance adjustment

● Objective	To correct for the variation in the sensitivity of the tracking photodiode.		
● Symptom when out of adjustment	Play does not start or track search is impossible.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open VR102 (TRK BAL) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK/MANUAL SEARCH FWD ⏭/▷▷ or ◁◁/⏮ key.
2. Press the PGM key, then the PLAY key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR102 (TRK BAL) so that the positive amplitude and negative amplitude of the tracking error signal at TP1 Pin 2 (TRK ERR) are the same (in other words, so that there is no DC component).



When there is a DC component

When there is no DC component

4. Pickup radial/tangential tilt adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken ; some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	● Player state	Test mode, play
		● Adjustment location	Pickup radial tilt adjustment screw and tangential tilt adjustment screw
		● Disc	YEDS-7

[Procedure]

1. Press the TRACK/MANUAL SEARCH FWD ⏭/▷▷ or ◁◁/⏮ key to move the pickup to halfway across the disc (R = 35 mm).
   Press the PGM key, the PLAY ▷ key, then the PAUSE ⏸ key in that order to close the focus servo then the spindle servo and put the player into play mode.

2. First, adjust the radial tilt adjustment screw with an M 3-mm hexagonal wrench so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly. For Multi-play CD type, use a Phillips screwdriver.

3. Next, adjust the tangential tilt adjustment screw with an M 3-mm hexagonal wrench so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5). For Multi-play CD type, use a Phillips screwdriver.

4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

   Note : Radial and tangential mean the directions relative to the disc shown in Figure 4.

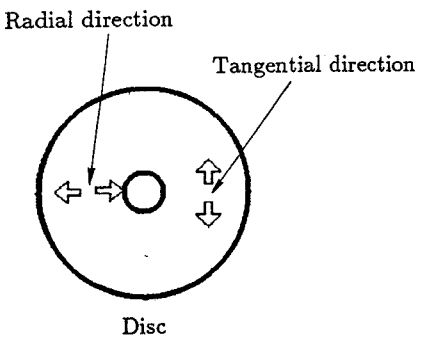
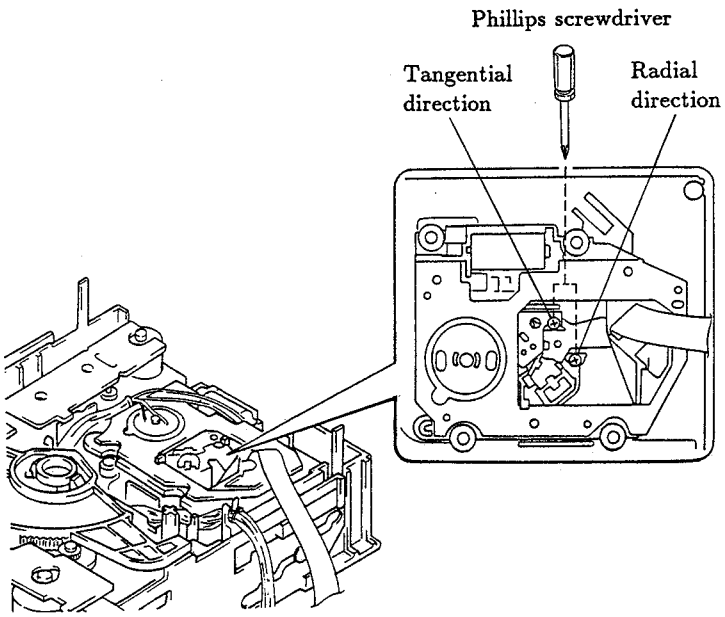


Figure 4



Adjustment Locations

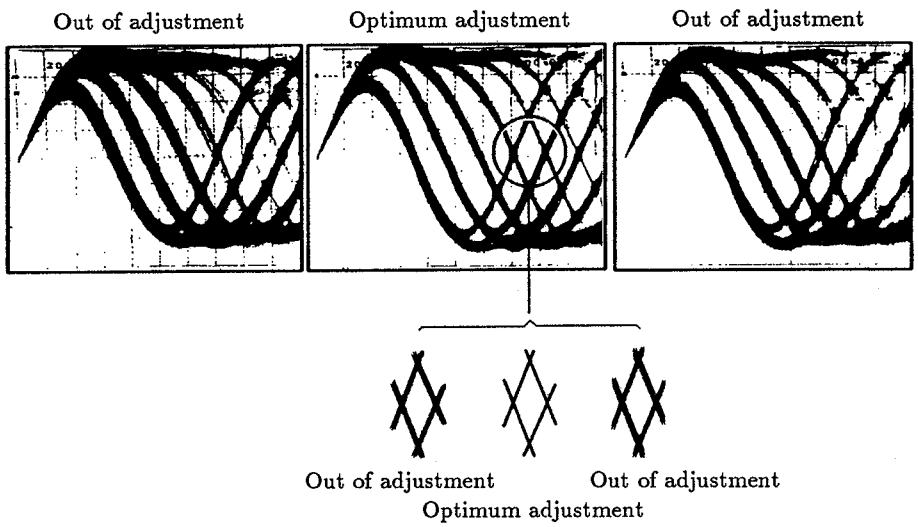


Figure 5 Eye pattern

5. RF level adjustment

● Objective	To optimize the playback RF signal amplitude		
● Symptom when out of adjustment	No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state	Test mode, play
		● Adjustment location	VR1 (laser power)
		● Disc	YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the TRACK/MANUAL SEARCH FWD ⏭/⏩ or ⏮/⏪ key, then press the PGM key, then the PLAY ▷ key in that order to close the respective servos and put the player into play mode..

2. Adjust VR1 (laser power) so that the RF signal amplitude is 1.2 Vp-p±0.1 V.

6. Focus servo loop gain adjustment

● Objective	To optimize the focus servo loop gain		
● Symptom when out of adjustment	Playback does not start or focus actuater noisy		
● Measurement instrument connections	See Figure 6. [Settings] CH1 CH2 20 mV/division 5 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR152 (FCS GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ⏭/▷▷ or ◁◁/⏮ key to move the pickup to halfway across the disc (R = 35 mm), then press the PGM key, the PLAY ▷ key, then the PAUSE ⏸ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

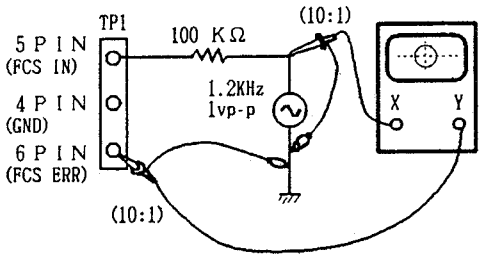
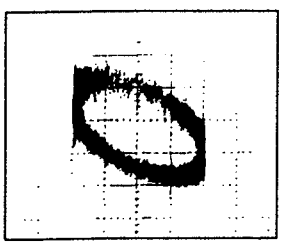
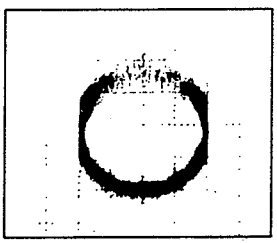


Figure 6

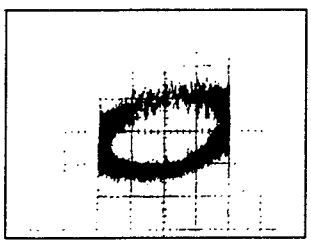
Focus Gain Adjustment



Higher gain



Optimum gain



Lower gain

7. Tracking servo loop gain adjustment

● Objective	To optimize the tracking servo loop gain		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Figure 7. [Settings] CH1 CH2 50 mV/division 50 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR151 (TRK GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the TRACK/MANUAL SEARCH FWD ⏭/▷▷ or ◁◁/⏮ key to move the pickup to halfway across the disc (R = 35 mm), then press the PGM key, the PLAY ▷ key, then the PAUSE ⏸ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK GAN) so that the Lissajous wave form is symmetrical about the X axis and the Y axis.

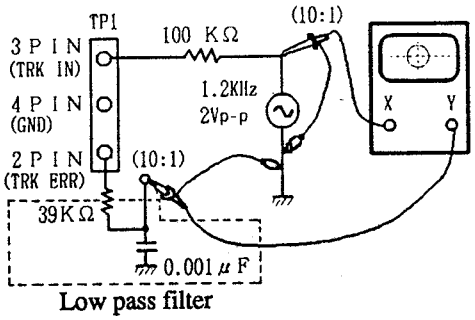
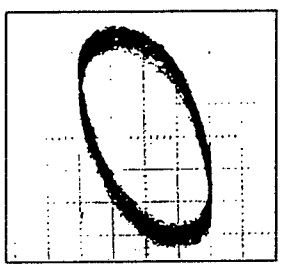
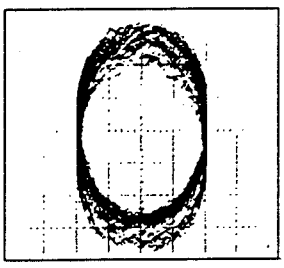


Figure 7

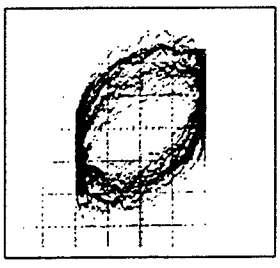
Tracking Gain Adjustment



Higher gain



Optimum gain



Lower gain

8. Focus error signal(focus S curve)verification

● Objective ● Symptom when out of adjustment	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the wave form for the focus error signal.		
● Measurement instrument connections	Connect the oscilloscope to TP1 Pin 6 (FOCS ERR). [Settings] 100 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TP1 Pin 5 to ground.

2. Mount the disc.

3. While watching the oscilloscope screen, press the PGM key and observe the wave form in Figure 8 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the wave form is only output for a moment when the PGM key is pressed, press this key over and over until you have checked the wave form.

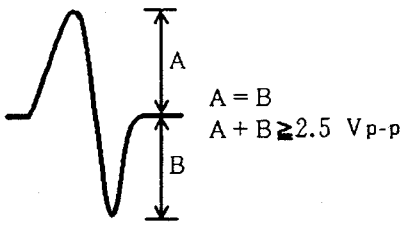


Figure 8

[Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).

2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).

3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2 : 1 ratio or more).

4. The RF signal is too small (less than 0.8 Vp-p) and even if VR1 is adjusted (laser power), the RF signal can not be brought up to the standard level.

7. RÉGLAGES

Si le lecteur CD est mal réglé, il risque de ne plus fonctionner normalement, voire ne plus fonctionner du tout, même si le capteur et la circuiterie en présentent aucune anomalie. Par conséquent, ajuster le lecteur correctement en suivant les démarches de réglage.

7-1. Points de réglage/Point et ordre de vérification

Etape	Point	Point d'essai	Emplacement du réglage
1	Réglage du décalage de la mise au point	TP 1, Broche 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Réglage du réseau de diffraction	TP 1, Broche 2 (TRK. ERR)	Fente de réglage du réseau de diffraction
3	Réglage d'équilibrage d'erreur d'alignement	TP 1, Broche 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Réglage d'inclinaison radiale/ tangentielle du capteur	TP 1, Broche 1 (RF)	Vis de réglage d'inclinaison radiale, Vis de réglage d'inclinaison tangentielle
5	Réglage du niveau RF	TP 1, Broche 1 (RF)	VR1 (niveau RF)
6	Réglage de gain de boucle asservie de la mise au point	TP 1, Broche 5 (FCS. IN) TP 1, Broche 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Réglage de gain de boucle asservie de l'alignement	TP 1, Broche 3 (TRK. IN) TP 1, Broche 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Vérification du signal d'erreur de la mise au point	TP 1, Broche 6 (FCS. ERR)	——

- Tableau des abbréviations

FCS. ERR : erreur de mise au point
FCS. OFS : décalage de mise au point
TRK. ERR : erreur d'alignement
TRK. BAL : équilibrage d'erreur d'alignement
FCS. IN : mise au point correcte
TRK. IN : alignement correct

7-2. Intruments de mesure et outils

1. Oscilloscope cathodique à deux faisceaux (sonde 10:1)
2. Oscillateur de basse fréquence
3. Disque d'essai (YEDS-7)
4. Filtre passe-bas (39 kΩ + 0,001 μF)
5. Résistance (100 kΩ)
6. Outils conventionnels

7-3. Point d'essai et positions de réglage de la résistance variable

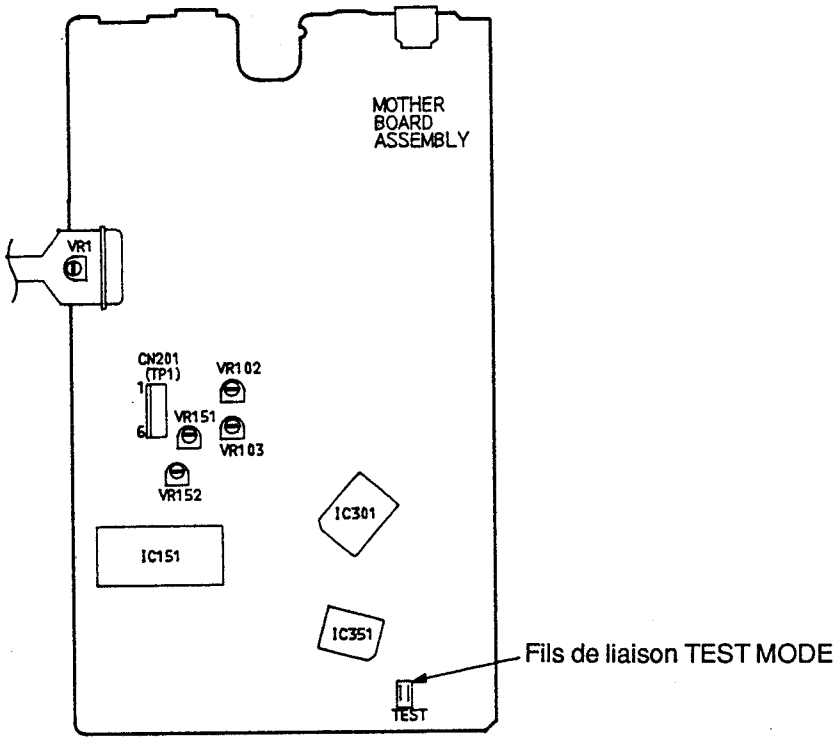


Figure 1 Emplacement des réglages

7-4. Remarques

1. Utiliser une sonde 10:1 pour l'oscilloscope.
2. Toutes les positions (réglages) des boutons de l'oscilloscope, dans les démarches de réglage, sont conçues pour l'usage d'une sonde 10:1.

7-5. Mode d'essai

Ces modèles sont munis d'un mode d'essai, de façon que les réglages requis à la réparation puissent être effectués aisément. Quand ces modèles sont en mode d'essai, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire. Les réglages et les vérifications peuvent s'effectuer par l'enclenchement de ces touches, à conditions de suivre les démarches requises. Dans le cas de ces modèles, tous les réglages sont réalisés en mode d'essai.

[Mise en mode d'essai]

Voici la manière de mettre le modèle en mode d'essai.

1. Commuter l'interrupteur d'alimentation sur arrêt.
2. Court-circuiter les fils de liaison du mode d'essai. (voir Figure 1).
3. Commuter l'interrupteur d'alimentation sur marche.

Quand le mode d'essai est correctement réglé, l'affichage est différent de celui qui apparaît généralement à la mise sous tension. Si l'affichage reste le même, le mode d'essai n'a pas été réglé correctement. Dans ce cas, répéter les étapes 1 à 3.

[Pour sortir du mode d'essai]

Voici la procédure pour sortir du mode d'essai.

1. Appuyer sur la touche STOP pour arrêter toutes ls opérations.
2. Sur le panneau avant, commuter l'interrupteur d'alimentation sur arrêt..

[Fonctionnement des touches en mode d'essai]

Code	Nom de la touche	Fonction en mode d'essai	Explications
	PGM (PROGRAM)	Fermeture du circuit asservi de la mise au point	La diode laser s'allume et l'actuateur de la mise au point se relève, puis s'abaisse lentement. et le circuit servo de la mise au point se ferme au point où la lentille de l'objectif se focalise sur le disque. Quand l'appareil est dans cet état, si l'on fait légèrement tourner à la main le disque arrêté, le bruit produit par le circuit servo de la mise au point sera audible. Si ce bruit est perçu, le circuit servo de la mise au point fonctionne correctement. Si cette touche est enclenchée et qu'aucun disque n'est installé, la diode laser s'allume, l'actuateur de la mise au point se soulève, se relvè, puis s'abaisse et se soulève, une deuxième fois et enfin, revient à sa position départ.
▷	PLAY	Asservissement de rotation en service	Démarre le moteur de rotation dans le sens des aiguilles d'une montre, quand la rotation du disque atteint la vitesse prescrite (environ 500 tours/min à la circonférence interne) et place le circuit servo de rotation dans une boucle fermée. Attention. Si cette touche est enfoncée et qu'un disque n'est pas installé, le moteur de rotation va tourner à la vitesse maximum. Si le circuit servo de la mise au point ne passe pas comme prévu dans une boucle fermée ou que la diode laser brille dans le miroir à la périphérie externe du disque, le même symptôme se produit.
▯▯	PAUSE	Ouverture/Fermeture du circuit servo de l'alignement	Le fait d'appuyer sur cette touche quand le circuit servo de la mise au point et de la rotation fonctionnent correctement en boucles fermées, place le circuit servo de l'alignement dans une boucle fermée, fait apparaître, sur le panneau avant, le numéro de la piste en cours de lecture et la durée écoulée, puis sort le signal de lecture. Si la durée écoulée n'est pas affichée ou n'est pas correctement calculée, ou si la reproduction sonore est anormale, il se peut que la diode laser s'active dans la section dépourvue de signaux enregistrés, au bord externe du disque, qu'un ajustement quelconque soit déréglé, ou qu'un autre problème se manifeste. Cette touche est de type à bascule et ouvre/ferme alternativement le circuit servo de l'alignement. Cette touche est inopérante si un disque n'est pas installé.

Code	Nom de la touche	Fonction en mode d'essai	Explications
⏮ / ⏮	TRACK/ MANUAL SEARCH REV	Inversion du chariot (vers l'intérieur)	Déplace le capteur vers la périphérie inteme du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en bouche fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
⏭ / ⏭	TRACK/ MANUAL SEARCH FWD	Inversion du chariot (vers l'extérieur)	Déplace le capteur vers la périphérie externe du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en bouche fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
□	STOP	Arrêt	Initialiser et la rotation du disque s'arrête. Le capteur et le disque ne bougent pas lorsque cette touche est enclenchée.
⏏	EJECT	Ejection du magasin à disques	Range le disque n°1 dans le magasin à disques, puis éjecte celui-ci. Cependant, bien que le magasin soit éjecté, le capteur ne revient pas sur sa position de départ. Même si le magasin à disques est reinstallé, la position du capteur reste inchangée.

Remarque : Lors de l'insertion du magasin, le disque 1 est chargé automatiquement.

[Lecture de disque en mode d'essai]

En mode d'essai, comme les circuits servo fonctionnent de manière indépendante, la lecture d'un disque exige que les touches soient enclenchées dans l'ordre prescrit, afin de fermer les circuits servo.
Voici l'ordre d'enclenchement des touches pour reproduire un disque en mode d'essai.

PGM	Allume la diode laser et ferme le circuit servo de la mise au point.
⇩	
PLAY ▷	Démarre le moteur de rotation et ferme le circuit servo de la rotation.
⇩	
PAUSE ▯▯	Ferme le circuit servo de l'alignement.

Attendre 2 à 3 secondes entre chaque opération.

1. Réglage du décalage de la mise au point

• Objectif	Règle le décalage CC de l'amplificateur d'erreur de mise au point.		
• Symptôme quand déréglé	Le lecteur ne procède plus à la mise au point et le signal RF n'est pas clair.		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR). [Réglages] 5 mV/division 10 ms/division mode CC	• Etat du lecteur • Emplacement du réglage • Disque	Mode d'essai, arrêté (juste l'interrupteur d'alimentation commuté sur marche) VR103 (FCS OFS) Aucun requis

[Marche à suivre]

Ajuster VR103 (FCS OFS) de façon que la tension à TP1 broche 6(FCS ERR) soit -150 ± 50 mV.

2. Réglage du réseau de diffraction

• Objectif	Pour aligner les points du rayon laser producteur d'erreur d'alignement sur l'angle optimum de la piste		
• Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible, les pistes sont sautées.		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR) via un filtre passe-bas. (Voir Figure 2)	• Etat du lecteur	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert
	[Réglages] 50 mV/division 5 ms/division mode CC	• Emplacement du réglage	Fente de réglage du réseau de diffraction du capteur
		• Disque	YEDS-7

[Marche à suivre]

1. Déplacer le capteur sur le bord externe du disque par la touche TRACK/MANUAL SEARCH FWD ⏭/⏩ ou la touche ⏪/⏮, de façon que la fente de rélage du réseau de diffraction se situe sur bord extérieur du disque, où elle peut être réglée.

   Remarque : Dans le cas d'un lecteur multidisque, utiliser la touche TRACK/MANUAL SEARCH FWD ⏭/⏩ ou la touche ⏪/⏮ pour déplacer le capteur à mi-chemin sur le disque(R = 35 mm).
2. Appuyer sur la touche PGM, puis sur la touche PLAY ▷ , dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Insérer un tournevis ordinaire dans le réscau de diffraction pour trouver le point zéro. Pour plus de déteils, voir page suivante.
4. Si l'on tourne lentement le tournevis dans le sens des aiguilles d'une montre à partir du point zéro, l'amplitude de l'onde augmente graduellement et si l'on continue à tourner le tournevis, l'amplitude de l'onde diminue de nouveau. Tourner le tournevis dans le sens des aiguilles d'une montre à partir du point zéro et régler le réscau de diffraction au premier point où l'amplitude de l'onde atteint son maximum.

   Référence : La Figure 3 illustre la relation entre l'angle du faisceau de l'alignement et la piste et la forme d'onde.

   Remarque : L'amplitude du signal d'erreur d'alignement se situe aux environs de 3Vc-c (quand un filtre passe-bas de 39kΩ + 0.001μF est utilisé). Si cette amplitude est extrêmement petite (2Vc-c ou moins), la lentille de l'objectif risque alors de s'encrasser ou le capteur risque de mal fonctionner. Si la différence entre l'amplitude du signal d'erreur au bord le plus intérieur et au bord le plus extérieur du disque est supérieure à 10%, ceci signifie que le réseau de diffraction n'est pas réglé à son point optimum. Dans ce cas, recommencer le réglage.
5. Replacer le capteur plus ou moins à mi-chemin sur le disque par la touche TRACK/MANUAL SEARCH FWD ⏭/⏩ ou la touche ⏪/⏮, appuyer sur la touche PAUSE ⏸ et vérifier que le numéro de piste et la durée écoulée sont affchés sur le panneau avant. Si ces paramétres n'apparaissent pas ce momont, ou que la durée écoulée change de manière irrégulière, vérifier le point zéro et recommencer le réglage du réscau de diffraction.

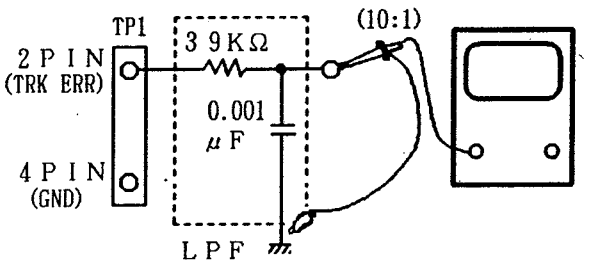
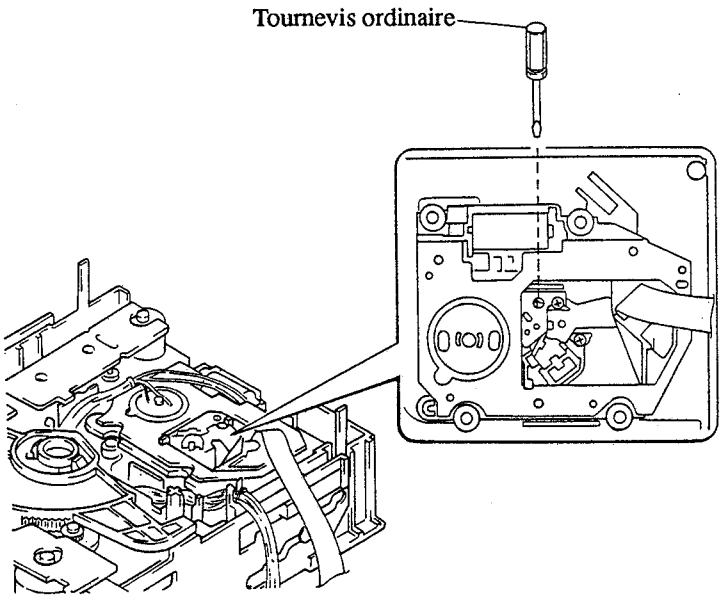


Figure 2



Emplacement des réglages

[Repérage du point zéro]

Quand le tournevis est introduit dans la fente de réglage du réseau de diffraction et que l'angle du réseau de diffraction est modifié, l'amplitude du signal d'erreur d'alignement à TP1, broche 2, change. Dans les limites de la plage du réseau de diffraction, il existe six emplacements où l'amplitude de l'onde atteint le minimum. Mais l'enveloppe de la forme d'onde n'est régulière qu'à un seul de ces emplacements. Ce point se situe à l'endroit où les trois rayons laser, divisés par le réseau de diffraction, se situent exactement sur la même piste (voir Figure 3).

Ce point s'appelle le point zéro. Lors du réglage du réseau de diffraction, ce point zéro est repéré et utilisé comme position de référence.

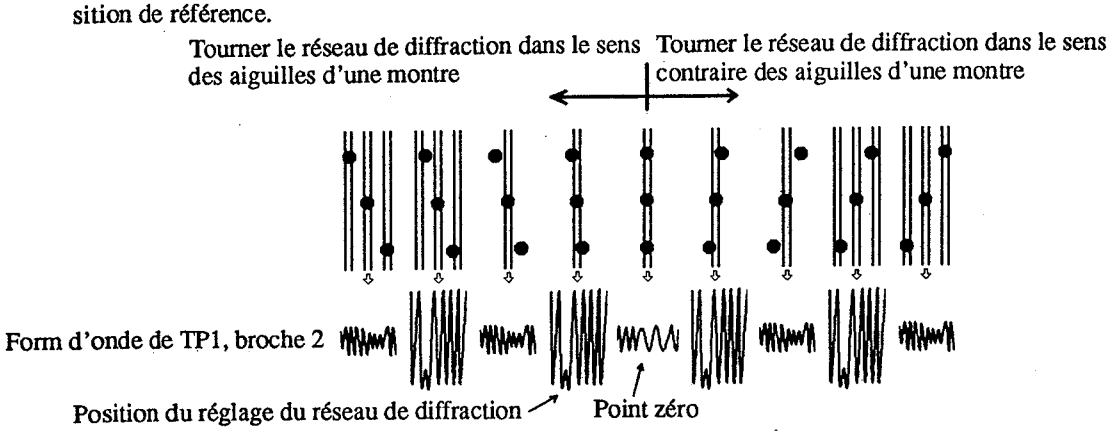
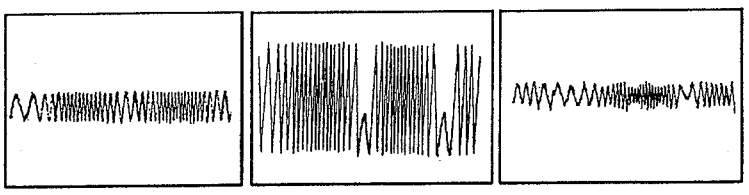

Tourner le réseau de diffraction dans le sens des aiguilles d'une montre
Tourner le réseau de diffraction dans le sens contraire des aiguilles d'une montre
Form d'onde de TP1, broche 2
Position du réglage du réseau de diffraction
Point zéro

Figure 3



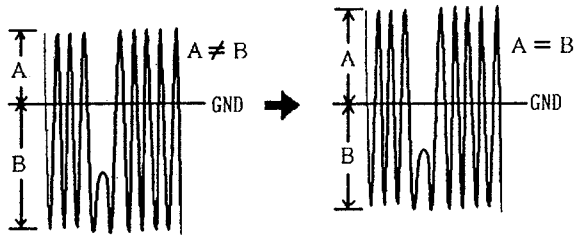
Forme d'onde du point zéro | Forme d'onde d'amplitude maximum | Forme d'onde autre que du point zéro

3. Réglage d'équilibrage d'erreur d'alignement

• Objectif • Symptôme quand déréglé	Pour corriger la variation de sensibilité de la photodiode d'alignement La lecture ne commence pas, la recherche de piste est impossible.		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR). [Réglages] 50 mV/division 5 ms/division mode CC	• Etat du lecteur • Emplacement du réglage • Disque	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert VR102 (TRK BAL) YEDS-7

[Marche à suivre]

1. Déplacer le capteur à mi-chemin sur le disque (R = 35 mm) par la touche TRACK/MANUAL SEARCH FWD ⏭/▷▷ ou la touche ◁◁/⏮.
2. Appuyer sur la touche PGM, puis sur la touche PLAY ▷, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Aligner la ligne lumineuse (masse) au centre de l'écran de l'oscilloscope et placer celui-ci en mode CC.
4. Ajuster VR102 (TRK BAL) de façon que l'amplitude positive et l'amplitude négative du signal d'erreur d'alignement à TP1, broche 2 (TRK ERR) soient identiques (c'est-à-dire, qu'il n'y ait aucun composant CC).



S'il y a un composant CC S'il n'y a pas de composant CC

4. Réglage d'inclinaison radiale/tangentielle du capteur

• Objectif	Pour régler l'angle du capteur par rapport au disque, de façon que les rayons laser frappent verticalement le disque et permettre ainsi la lecture optimum des signaux RF.		
• Symptôme quand déréglé	Son interrompu; certains disques peuvent être lus et pas d'autres.		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF). [Réglages] 20 mV/division 200 ns/division mode CA	• Etat du lecteur	Mode d'essai, lecture
		• Emplacement du réglage	Vis de réglage d'inclinaison radiale Vis de réglage d'inclinaison tangentielle
		• Disque	YEDS-7

[Marche à suivre]

1. Dans le cas d'un lecteur multidisque, utiliser la touche TRACK/MANUAL SEARCH FWD ⏭/⏩ ou la touche ⏪/⏮ pour déplacer le capteur à mi-chemin sur le disque (R = 35 mm).
   Appuyer sur la touche PGM , PLAY ▷ et PAUSE ⏸ dans cet ordre, afin de fermer le circuit servo de la mise au point, puis celui de la rotation et placer le lecteur en mode de lecture.
2. D'abord, ajuster la vis d'inclinaison radiale à l'aide d'une clé hexagonale M de 3 mm, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible. Dans le cas d'un lecteur multidisque, utiliser un tournevis Phillips.
3. Ensuite, ajuster la vis d'inclinaison tangentielle à l'aide d'une clé hexagonale M de 3 mm, de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible (Figure 5). Dans le cas d'un lecteur multidisque, utiliser un tournevis Phillips.
4. Ajuster de nouveau la vis d'inclinaison radiale et la vis d'inclinaison tangentielle de façon que le motif en oeil soit le plus clairement visible. Le cas échéant, régler les deux vis de façon que le motif en oeil soit le plus clairement visible.
   Remarque : "Radial" et "tangentiel" se rapportent aux sens par rapport au disque illustré à la Figure 4.

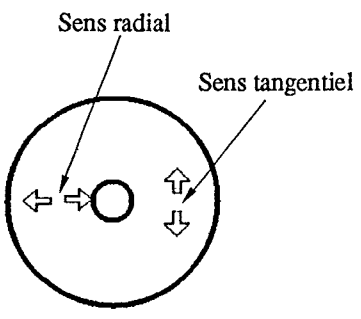
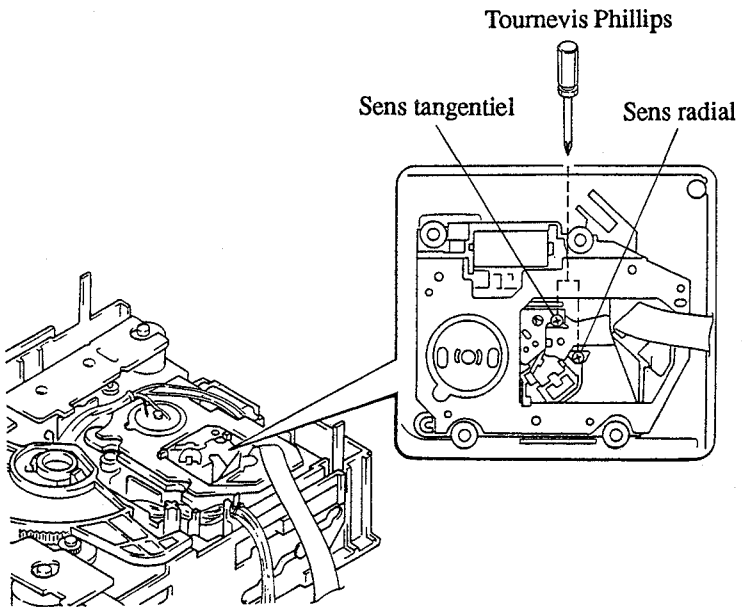


Figure 4



Emplacements des réglages

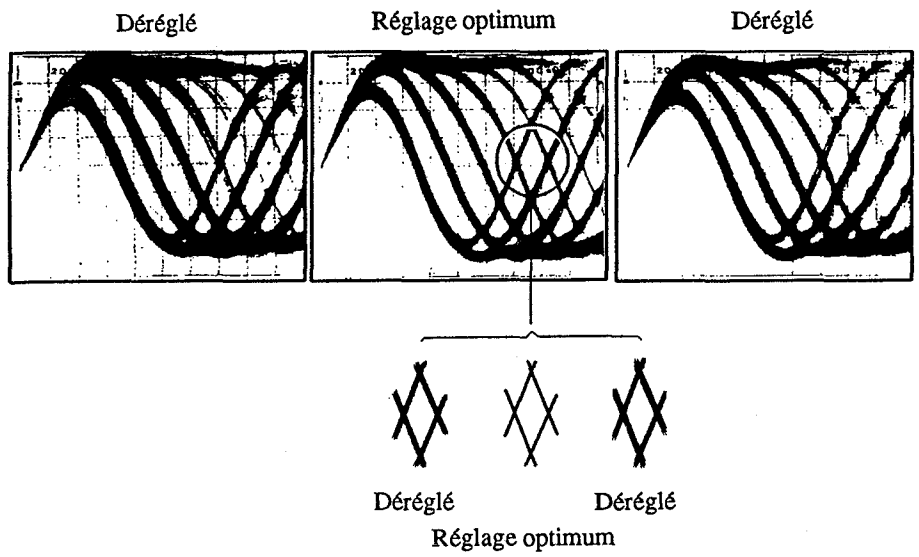


Figure 5 Motif en oeil

5. Réglage du niveau RF (niveau RF)

• Objectif	Pour optimaliser l'amplitude du signal RF de lecture		
• Symptôme quand déréglé	Pas de lecture ni de recherche		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF). [Réglages] 50 mV/division 10 ms/division mode CA	• Etat du lecteur • Emplacement du réglage • Disque	Mode d'essai, lecture VR1 (alimentation du laser) YEDS-7

[Marche à suivre]

1. Placer le capteur à mi-chemin sur le disque (R = 35 mm) à l'aide de la touche TRACK/MANUAL SEARCH FWD ⏭/⏩ ou la touche ⏪/⏮.
   Ensuite, appuyer sur la touche TRACK FWD ⏭ puis sur la touche PLAY ▷, dans cet ordre, pour fermer les circuits servo respectifs et mettre le lecteur en mode de lecteur.
2. Ajuster VR1 (alimentation du laser) de façon que l'amplitude du signal RF atteigne 1,2 Vc-c ± 0,1 V.

6. Réglage de gain de boucle asservie de la mise au point

• Objectif	Pour optimaliser le gain de la boucle d'asservissement de la mise au point.		
• Symptôme quand déréglé	La lecture ne commence pas ou l'actuateur de la mise au point est parasité.		
• Raccordement des instruments de mesure	Voir Figure 6. [Réglages] CAN.1 CAN.2 20 mV/division 5 mV/division Mode X-Y	• Etat du lecteur • Emplacement du réglage • Disque	Mode d'essai, lecture VR152 (FCS GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK/MANUAL SEARCH FWD ⏭/⏩ ou la touche ⏮/⏪ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche PGM , la touche PLAY ▷ , puis sur la touche PLAY ⏸ , dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR152 (FSC GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

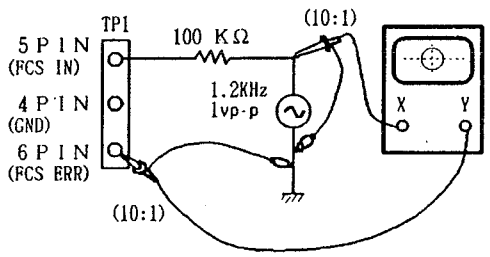
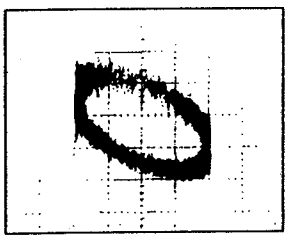
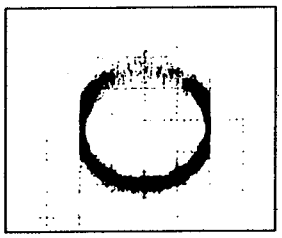


Figure 6

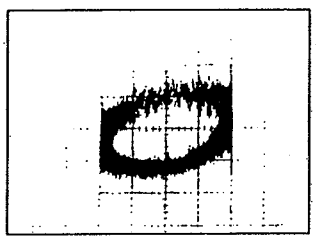
Adjustment de gain de mise au point



Gain Supérieur



Gain optimum



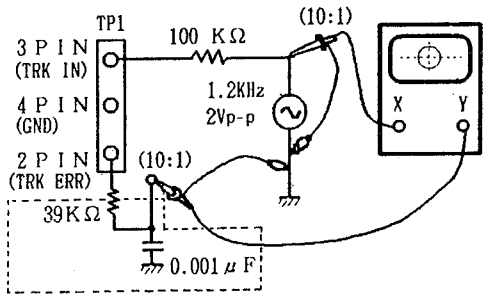
Gain inférieur

7. Réglage de gain de boucle asservie de l'alignement

• Objectif	Pour optimaliser le gain de la boucle d'asservissement de l'alignement.		
• Symptôme quand déréglé	La lecture ne commence pas, l'actuateur est parasité pendant la recherche, ou des pistes sont sautées.		
• Raccordement des instruments de mesure	Voir Figure 7. [Réglages] CAN.1 CAN.2 50 mV/division 50mV/division Mode X-Y	• Etat du lecteur • Emplacement du réglage • Disque	Mode d'essai, lecture VR151 (TRK GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche TRACK/MANUAL SEARCH FWD ⏭/⏩ ou la touche ⏮/⏪ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche PGM , la touche PLAY ▷ , puis sur la touche PAUSE ⏸ , dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR151 (TRK GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

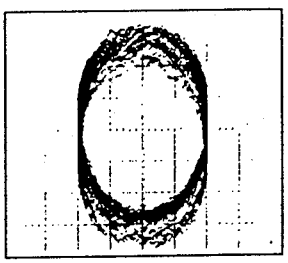


Filtre passe-bas

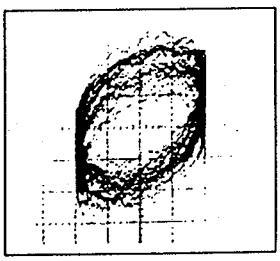
Figure 7

Adjustment de gain d'alignement

Gain Supérieur



Gain optimum



Gain inférieur

8. Vérification du signal d'erreur de la mise au point

• Objectif • Symptôme quand déréglé	Pour juger si le capteur est bon ou pas, en observant le signal d'erreur de la mise au point. L'état du capteur s'évalue à partir de l'amplitude du signal d'erreur d'alignement (comme décrit dans le paragraphe relatif à l'équilibrage d'erreur d'alignement), ainsi qu'à partir de la forme d'onde du signal d'erreur de mise au point.		
• Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR). [Réglages] 100 mV/division 5 ms/division mode CC	• Etat du lecteur • Emplacement du réglage • Disque	Mode de test, arrêt Aucun YEDS-7

[Marche à suivre]

1. Raccorder TP1, broche 5 à la masse.
2. Installer le disque.
3. Tout en regardant l'écran de l'oscilloscope, appuyer sur la touche PGM et observer la forme d'onde de la Figure 8, pendant quelques instants. Vérifier que l'amplitude atteint au moins 2,5 Vc-c et que les amplitudes positive et négatives soient égales. Comme la forme ne sort que pour un moment, quand la touche PGM est enclenchée, appuyer sur à plusieurs reprises sur cette touche, jusqu'à ce que la forme d'onde ait été vérifiée.

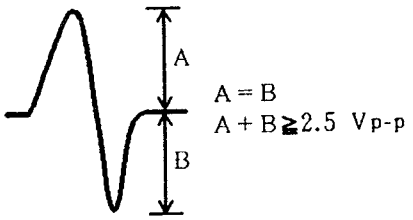


Figure 8

[Evaluation du capteur]

Ne pas tenter d'évaluer l'état du capteur tant que tous les réglages ne sont pas corrects. Les cas suivants témoignent de l'anomalie du capteur.

1. L'amplitude du signal d'erreur d'alignement est extrêmement petite (inférieure à 2 Vc-c).
2. L'amplitude du signal d'erreur de mise au point est extrêmement petite (inférieure à 2,5 Vc-c).
3. Les amplitudes positive et négative du signal d'erreur de mise au point sont extrêmement asymétriques (taux 2:1 ou plus).
4. Le signal RF est trop petit (inférieur à 0,8 Vc-c) et même si VR1 (alimentation du laser) est ajustée, le signal RF ne peut être élevé au niveau standard.

7. AJUSTE

Si un reproductor de discos compactos se ajusta incorrecta o inadecuadamente, puede funcionar mal o no trabajar incluso aunque no exista ningún problema en el captor ni en los circuitos. Ajuste correctamente siguiendo el procedimiento de ajuste.

7-1. Ítemes de ajuste/verificación y orden

Paso	Ítem	Punto de prueba	Lugar de ajuste
1	Ajuste del descentramiento de enfoque	TP 1, Patilla 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Ajuste de retícula	TP 1, Patilla 2 (TRK. ERR)	Ranura de ajuste de retícula
3	Ajuste del equilibrio de ajuste de seguimiento	TP 1, Patilla 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Ajuste de la inclinación en sentido radial/ tangencial del captor	TP 1, Patilla 1 (RF)	Tornillo de ajuste de la inclinación radial Tornillo de ajuste de la inclinación tangencial
5	Ajuste del nivel de RF	TP 1, Patilla 1 (RF)	VR1 (Nivel de RF)
6	Ajuste de la ganancia del bucle del servo de enfoque	TP 1, Patilla 5 (FCS. IN) TP 1, Patilla 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Ajuste de la ganancia del bucle del servo de seguimiento	TP 1, Patilla 3 (TRK. IN) TP 1, Patilla 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Verificación de la señal de error de enfoque	TP 1, Patilla 6 (FCS. ERR)	——

- Tabla de abreviaturas

FCS. ERR : Error de enfoque
FCS. OFS : Descentramiento de enfoque
TRK.ERR : Error de seguimiento
TRK. BAL : Equilibrio de seguimiento
FCS.IN : Entrada de enfoque
TRK. IN : Entrada de seguimiento

7-2. Instrumentos y herramientas de medición

1. Osciloscopio de doble traza (Sonda de 10:1)
2. Oscilador de baja frecuencia
3. Disco de prueba (YEDS-7)
4. Filtro de paso bajo (39 kΩ, 0,001 μF)
5. Resistor (100 kΩ)
6. Herramientas estándar

7-3. Ubicaci´on de los putos de prueba y los resitores variables de ajuste

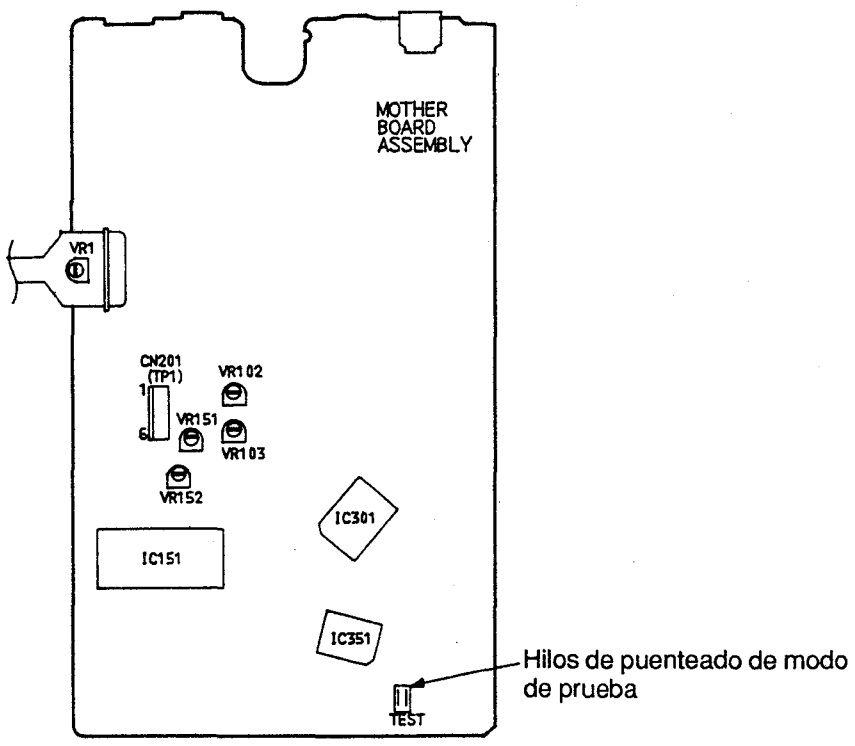


Figura 1 Lugares de ajuste

7-4. Notas

1. Emplee una sonda de 10:1 para el osciloscopio.
2. Todas las posiciones de los mandos (ajustes) para el osciloscopio de los procedimientos de ajuste son para cuando se emplee la sonda de 10:1.

7-5. Modo de prueba

Estos modelos poseen un modo de prueba que permite realizar fácilmente los ajustes y las comprobaciones requeridos para el servicio. Cuando estos modelos estén en el modo de prueba, las teclas del panel frontal trabajarán de forma diferente a la normal. Los ajustes y las comprobaciones podrán realizarse accionando estas teclas de acuerdo con el procedimiento correcto. Para estos modelos, todos los ajustes se realizarán en el modo de prueba.

[Puesta de estos modelos en el modo de prueba]

A continuación se indica cómo poner estos modelos en el modo de prueba.

1. Ponga en OFF el interruptor de alimentación.
2. Cortocircuite los hilos de puenteado de modo de prueba. (Consulte la figura 1.)
3. Ponga en ON el interruptor de alimentación.

Cuando haya ajustado correctamente el modo de prueba, la visualización será diferente a la obtenida normalmente al conectar la alimentación. Si la visualización sigue siendo la normal, el modo de prueba no se habrá ajustado normalmente, por lo que tendrá que repetir los pasos 1 a 3.

[Desactivación del modo de prueba]

A continuación se indica el procedimiento para desactivar el modo de prueba.
1. Presione la tecla STOP y cese todas las operaciones.
2. Ponga en OFF el interruptor de alimentación del panel frontal.

[Operaciones de teclas en el modo de prueba]

Código	Nombre de la tecla	Fonción en el mode de prueba	Explicación
	PGM (PROGRAM)	Cierre del servo de enfoque	El diodo láser se encenderá y el actuador de enfoque se eleva, despué se desciende lentamente, y el servo de enfoque se cerrará en el punto en el que el ovjetivo se enfoque sobre el disco. Con el reproductor en este estado, si gira ligeramente con la mano el disco parado, podrá oír el sonido del servo de enfoque. Si puede oír este sonido, el servo de enfoque estará funcionando correctamente. Si presiona esta tecla sin disco montado, el diodo láser se encenderá, el actuador de enfoque se ve empujado hacia arriba, y después se levantará y descenderá y se eleva dos veces, y volverá a su posición original.
▷	PLAY	Activación del servo del eje	Pondrá en marcha el motor del eje haciéndolo girar hacia la derecha y después la rotación del disco alcanzará la velocidad prescrita (unas 500 rpm en la periferia interior), y pondrá el servo del eje en un bucle cerrado. Tenga cuidado. Si presiona esta tecla çuando no haya disco montado, el motor del eje girará a la velocidad máxima. Si el servo de enfoque no pasa correctamente a un bucle cerrado, o si el haz lasérico incide en la sección del espejo en el la periferia del disco, ocurrirá el mismo síntoma.
▯▯	PAUSE	Apertura/cierre del servo de seguimiento	Si presiona esta tecla cuando el servo de enfoque y el servo del eje están funcionando correctamente en bucles cerrados, el servo de sequimiento se pondrá en bucle cerrado, en el panel frontal se visualizarán el número de canción que esté reproduciéndose y el tiempo transcurrido, y se producirá la salida de la señal de reproducción. Si el tiempo transcurrido no se visualiza o no se cuenta correctamente, o si el sonido no se reproduce correctamente, es posible que el rayo lasérico esté incidiendo en la sección sin sonido grabado en el borde exterior del disco, o que exista algún otro problema. Esta tecla es basculante (de acción alternativa) y abre/cierra el servo de seguimiento alternativamente. Esta tecla no funcionará cuando no haya disco montado.

Código	Nombre de la tecla	Fonción en el mode de prueba	Explicación
⏮ / ⏮	TRACK/ MANUAL SEARCH REV	Retroceso del carro (hacia adentro)	Moverá la posición del captor hacia el diámetro interior del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el puto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
⏭ / ⏭	TRACK/ MANUAL SEARCH FWD	Avance del carro (hacia afuera)	Moverá la posición del captor hacia la periferia del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el puto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
□	STOP	Parada	Inicializa y se para la rotacion del desco. El captor y el disco permanecen donde están cuando se presiona esta tecla.
⏏	EJECT	Expulsión del cargador de discos compactos	Almacenará el disco 1 en el cargador de discos compactos, y después expulsará dicho cargador. Sin embargo, aunque el cargador de discos compactos sea expulsado, el captor no volverá a su posición de reposo. Aunque vuelva a montar el cargador de discos compactos, el captor permanecerá donde estaba.

Nota : Cuando inserte el cargador, el disco 1 del mismo se cargará automáticamente.

[Cómo reproducir un disco en el modo de prueba]

En el modo de prueba, como los servos funcionan independientemente, la reproducción de un disco requiere el que usted emplee las teclas en el orden correcto para cerrar los servos.

A continuación se indica la secuencia de operación de teclas para reproducir un disco en el modo de prueba.

PGM	Hará que se encienda el diodo láser y cerrará el servo de enfoque.
⇓	
PLAY ▷	Pondrá en marcha el motor del eje y hará que se cierre el servo del eje.
⇓	
PAUSE ▯▯	Cerrará el servo de seguimiento.

Espere de 2 a 3 segundos por lo menos entre cada una de estas operaciones.

1. Ajuste del descentramiento del enfoque

• Objetivo	Ajuste de la tensión de CC para el amplificador de error de enfoque.		
• Síntomas en caso de desajuste	El reproductor no enfoca y la señal de RF contiene perturbaciones.		
• Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR). [Ajustes] 5 mV/división 10 ms/división modo de CC	• Estado del reproductor	Modo de prueba, parado (con el interruptor de alimentación en ON)
		• Lugar de ajuste	VR103 (FCS OFS)
		• Disco	No es necesario

[Procedimiento]

Ajuste VR103 (FCS OFS) de forma que la tensión de CC de TP1, patilla 6, (FCS ERR) sea de -150 ± 50 mV.

2. Ajuste de retícula

• Objetivo	Alineación de los puntos del haz lasérico de generación de error de seguimiento al ángulo óptimo en la pista		
• Síntomas en caso de desajuste	La reproducción no se inicia, la búsqueda de canciones es imposible, las pistas se saltan.		
• Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR) a través de un filtro de paso bajo. (Consulte la figura 2)	• Estado del reproductor	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto
		• Lugar de ajuste	Ranura de ajuste de retícula del captor
	[Ajustes] 50 mV/división 5 ms/división modo de CC	• Disco	YEDS-7

[Procedimiento]

1. Mueva el captor hasta el borde exterior del disco con la tecla TRACK/MANUAL SEARCH FWD ⏭/▷▷ o ◁◁/⏮ de forma que la ranura de ajuste de la retícula quede en el borde exterior del disco, donce puede ajustarse.

   Nota : Para un reproductor de reproducción mútiple de disco compacto, emplee la tecla TRACK/MANUAL SEARCH FWD ⏭/▷▷ o ◁◁/⏮ a fin de mover el captor hasta la mitad del disco (R = 35 mm).

2. Presione la tecla PGM, y deupués la tecla PLAY ▷, por este orden, a fin de cerrar el servo de enfoque y desupués el servo del eje.

3. Inserte un destornillador normal en la ranura de ajuste de la retícula y ajuste la retícula hasta encontrar el punto nulo. Para más detalles, cunsulte la página siguiente.

4. Si gira lentamente el destornillador hacia la derecha desde el punto nulo, la amplitud de la onda aumentará gradualmente. Después, si continúa girando el destornillador, la amplitud de la onda se volverá otra vez más pequeña. Gire el destomillador hacia la derecha desde el punto nulo y ajuste la retícula al primer punto en el que la amplitud de la onda alcance su valor máximo.

Referencia : En la figura 3 se muestra la relación entre el ángulo del haz de seguimiento con la pista y la forma de onda.

Nota : La amplitud de la señal de error de seguimiento será de aproximadamente 3Vp-p (cuando se emplee un filtro de paso bajo de 38kΩ,0.001μF). Si esta amplitud es extremadamente pequeña (2Vp-p o menos), es posible que el objetivo esté sucio o que el captor esté funcionando mal. Si la diferencia entre la amplitud de la señal de error en el borde interior y exterior del disco es superior al 10%, la retícula no estará ajustada al punto óptimo, por lo que tendrá que volver a ajustaria.

5. Devuelva el captor hasta la mitad más o menos del disco con la tecla TRACK/MANUAL SEARCH FWD ⏭/▷▷ o ◁◁/⏮, presione latecla PAUSE ⏸, y vuelva a comprobar si en el panel frontal se visualizan el número de canción y el tiempo transcurrido. Si no se visualizan esta vez, o si el tiempo transcurrido cambia irregularmente, vuelva a comprobar el punto nulo y ajuste otra vez la retícula.

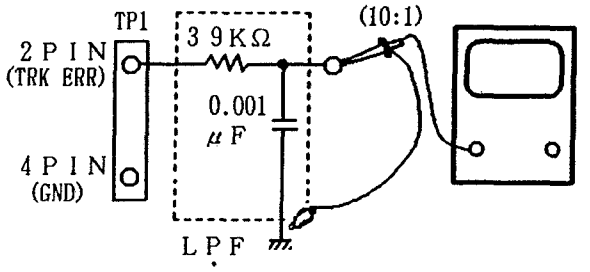
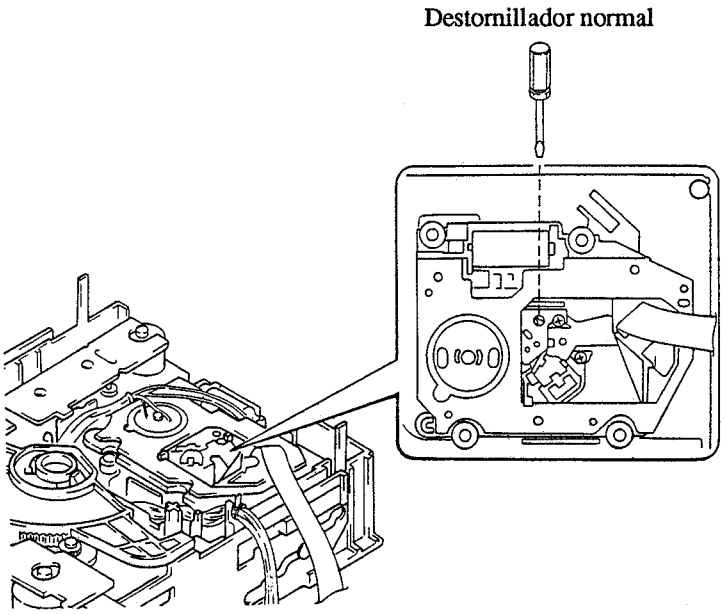


Figura 2



Lugares de ajuste

[Cómo encontrar el punto nulo]

Cuando inserte el destornillador normal en la ranura para el ajuste de la retícula y cambie el ángulo de la misma. La amplitud de la señal de error de seguimiento de TP1, patilla 2, cambiará. Dentro del margen para la retícula existen cinco o seis lugares en los que la amplitud alcanza el valor mínimo. De estos cinco o seis lugares, solamente hay uno en el que la envolvente de la forma de onda es uniforme. Este lugar es donde los tres haces láséricos divididos por la retícula se encuentran exactamente sobre la misma pista. (Consulte la figura 3.)

Este punto se denomina punto nulo. Cuando ajuste la retícula, este punto se encontrará y empleará como posición de referencia.

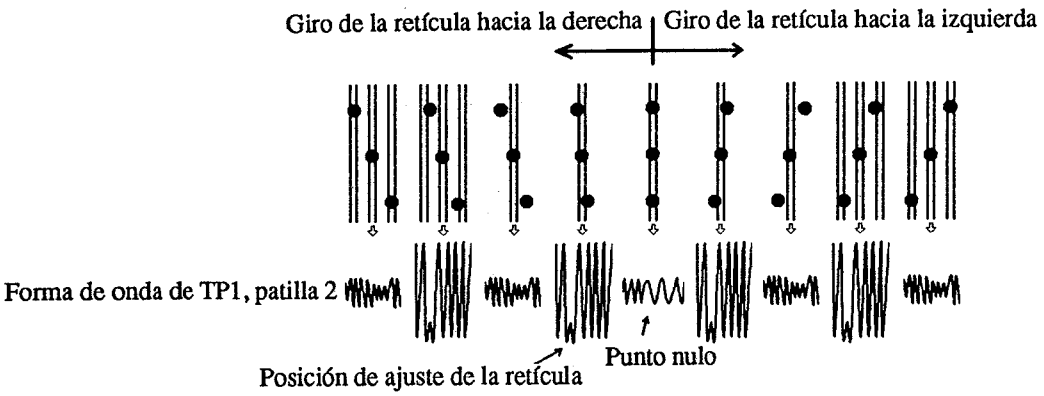
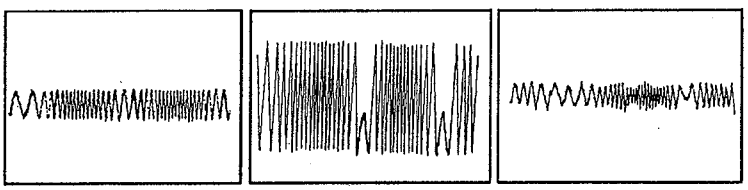

Giro de la retícula hacia la derecha
Giro de la retícula hacia la izquierda
Forma de onda de TP1, patilla 2
Punto nulo
Posición de ajuste de la retícula

Figura 3



Forma de onda del punto nulo

Forma de onda de amplitud máxima

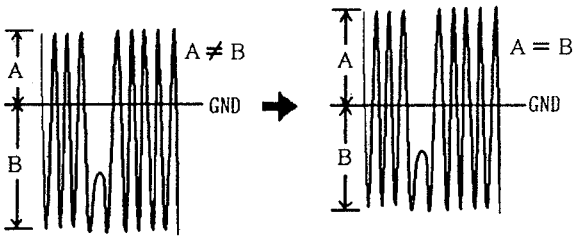
Forma de onda que no es el punto nulo

3. Ajuste del equilibrio de error de seguimiento

• Objetivo	Corrección de la variación de la sensibilidad del fotodiodo de seguimiento		
• Síntomas en caso de desajuste	La reproducción no se inicia o la búsqueda de canciones es imposible.		
• Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR). Esta conexión puede realizarse a través de un filtro de paso bajo. [Ajustes] 50 mV/división 5 ms/división modo de CC	• Estado del reproductor • Lugar de ajuste • Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto VR102 (TRK BAL) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla TRACK/MANUAL SEARCH FWD ⏭/⏩ o ⏮/⏪.
2. Presione la tecla PGM, y después la tecla PLAY ▷, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Haga coincidir la línea brillante (masa) del centro de la pantalla del osciloscopio y ponga éste en el modo de CC.
4. Ajuste VR102 (TRK BAL) de forma que la amplitud positiva y la negativa de la señal de error de seguimiento de TP1, patilla 2, (TRK ERR) sean iguales (en otras palabras, de forma que no haya componente de CC).



Cuando hay componente de CC

Cuando no hay componente de CC

4. Ajuste de la inclinación en sentido radial/tangencial del captor

• Objetivo	Ajustar el ángulo del captor en relación con el disco de forma que los haces lasércicos incidan perpendicularmente sobre el mismo a fin de poder leer con la mayor exactitud las señales de RF.		
• Síntomas en caso de desajuste	Sonido quebrado, algunos discos pueden reproducirse pero otros no.		
• Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 20 mV/división 200 ns/división modo de CA	• Estado del reproductor	Modo de prueba, reproducción
		• Lugar de ajuste	Tornillo de ajuste de la inclinación radial y tornillo de ajuste de la inclinación tangencial
		• Disco	YEDS-7

[Procedimiento]

1. Para un tipo de reproducción múltiple de disco compacto, emplee la tecla TRACK/MANUAL SEARCH FWD ⏭/▷▷ o ◁◁/⏮ a fin de mover el captor hasta la mitad del disco (R = 35 mm).
   Presione la tecla PGM, la tecla PLAY ▷ , y después la tecla PAUSE ⏸ , por este orden, a fin de cerrar el servo de enfoque, después el servo del eje, y por último para poner el reproductor en el modo de reproducción.
2. En primer lugar, gire el tornillo de ajuste de inclinación radial con una llave hexagonal M 3 mm hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad. Para un tipo de reproducción múltiple de disco compacto, emplee un destornillador Phillips.
3. A continuación, ajuste el tornillo de ajuste de inclinación tangencial con una llave hexagonal M 3 mm hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad (figura 5). Para un tipo de reproducción múltiple de disco compacto, emplee un destornillador Phillips.
4. Vuelva a girar el tornillo de ajuste de inclinación radial y el tornillo de inclinación tangencial hasta que el patrón ocular pueda verse con la mayor claridad. Si es necesario, ajuste alternativamente los dos tornillos hasta que el patrón ocular pueda verse con la mayor claridad.
   Nota : Radial y tangencial significan las direcciones en relación con el disco mostrado en la figura 4.

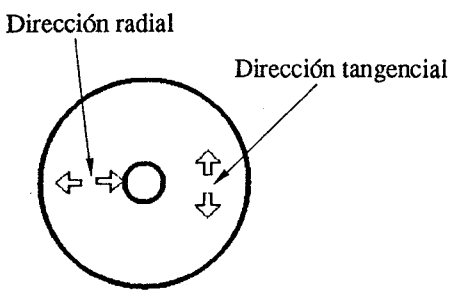
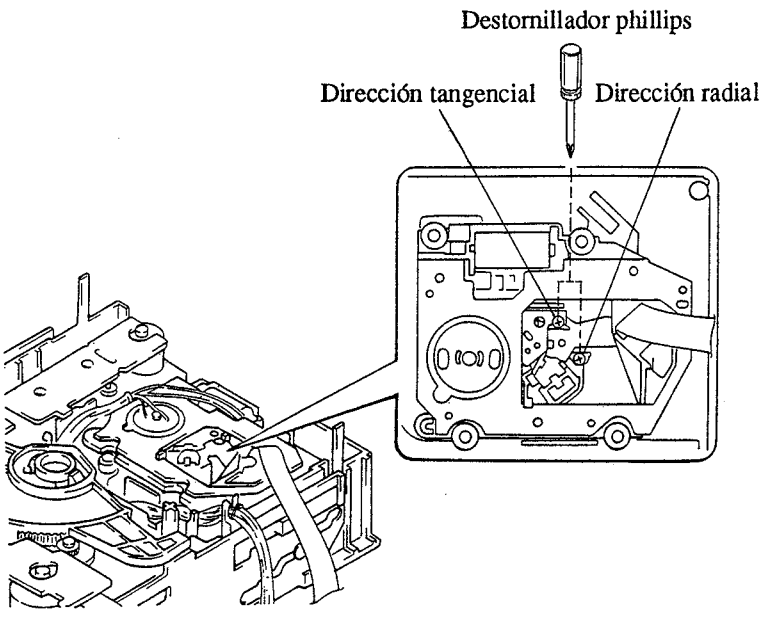


Figura 4



Lugares de ajuste

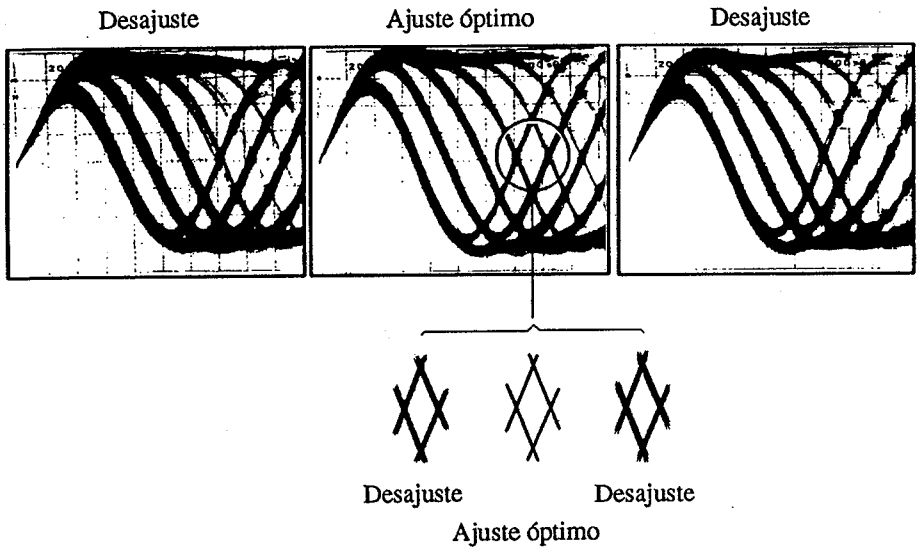


Figura 5 Patron optico

5. Ajuste del nivel de RF

• Objetivo	Optimización de la amplitud de la señal de RF de reproducción		
• Síntomas en caso de desajuste	La reproducción no se inicia o la búsqueda de canciones es imposible.		
• Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF).	• Estado del reproductor	Modo de prueba, reproducción
	[Ajustes] 50 mV/división 10ms/división modo de CA	• Lugar de ajuste	VR1 (potencia de láser)
		• Disco	YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla TRACK/MANUAL SEARCH FWD ⏭/⏩ o ⏮/⏪, presione la tecla PGM, depués la tecla PLAY ▷, por este orden a fin de cerrar los servos respectivos, y ponga el reproductor en el mode de reproducción.
2. Ajuste VR1 (potencia de láser) de forma que la amplitud de la señal de RF sea de 1,2 Vp-p ± 0,1 V.

6. Ajuste de la ganancia del bucle del servo de enfoque

• Objetivo • Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de enfoque La reproducción no se inicia o el actuador de enfoque produce ruido.		
• Conexión de los instrumentos de medición	Consulte la figura 6. [Ajustes] CH1 CH2 20 mV/división 5 mV/división Modo X - Y	• Estado del reproductor • Lugar de ajuste • Disco	Modo de prueba, reproducción VR152 (FCS GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK/MANUAL SEARCH FWD ⏭/⏩ o ⏮/⏪ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla PGM, la tecla PLAY ▷ , y después la tecla PAUSE ⏸ , por este orden, a fin de cerrar los servos correspondientes y poner el reproductor en el modo de reproducción.
3. Ajuste VR152 (FCS GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

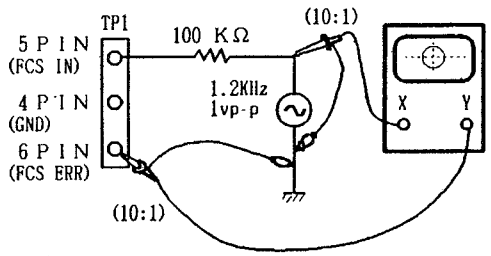
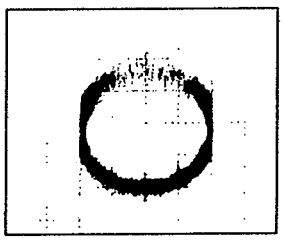


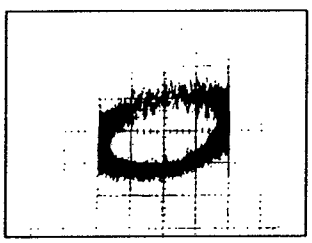
Figura 6

Ajuste de la ganancia de enfoque

Ganancia superior



Ganancia óptima



Ganancia inferior

7. Ajuste de la ganancia del bucle del servo de seguimiento

• Objetivo • Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de seguimiento La reproducción no se inicia, el actuador de enfoque produce ruido, o se saltan pistas.		
• Conexión de los instrumentos de medición	Consulte la figura 7. [Ajustes] CH1 CH2 50 mV/división 50mV/división Modo X - Y	• Estado del reproductor • Lugar de ajuste • Disco	Mode de prueba, reproducción VR151 (TRK GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla TRACK/MANUAL SEARCH FWD ⏭/⏩ o ⏮/⏪ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla PGM , la tecla PLAY ▷ , y la tecla PAUSE ⏸ , por este orden, a fin de cerrar los servos respectivos y poner el reproductor en el modo de reproducción.
3. Ajuste VR151 (TRK GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

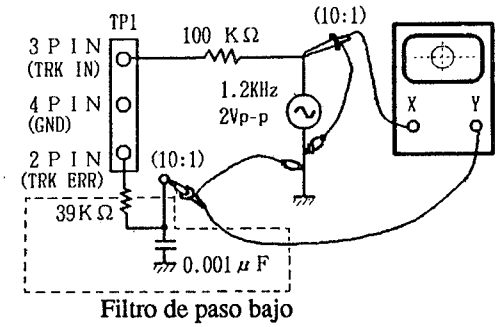
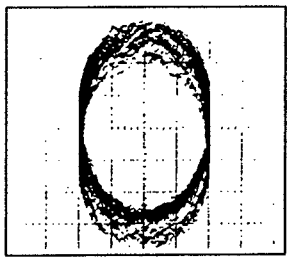


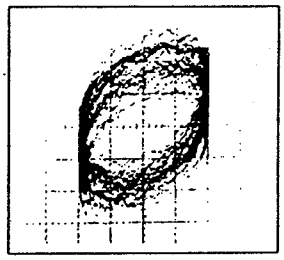
Figura 7

Ajuste de la ganancia de seguimiento

Ganancia superior



Ganancia óptima



Ganancia inferior

8. Verificación de la señal de error de enfoque (curva S de enfoque)

• Objetivo • Síntomas en caso de desajuste	Juzgar si el captor est'a bien o no observando la señal de error de enfoque. El captor se juzga por la amplitud de la señal de error de seguimiento (como se ha indicado en la sección sobre el ajuste del equilibrio de error de seguimiento) y la forma de onda de la señal de error de enfoque.		
• Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR). [Ajustes] 100 mV/división 5 ms/división modo de CC	• Estado del reproductor • Lugar de ajuste • Disco	Modo de prueba, parada Ninguno YEDS-7

[Procedimiento]

1. Conecte TP1, patilla 5, a masa.
2. Coloque el disco.
3. Contemplando la pantalla del osciloscopio, presione la tecla PGM y observe durante un momento la forma de onda de la figura 8. Verifique si la amplitud es de 2,5 Vp-p por lo menos y si la amplitud de las partes positiva y negativa son iguales. Como la forma de onda solamente sale durante un momento cuando se presiona la tecla PGM , presione una y otra vez esta tecla hasta que logre comprobar la forma de onda.

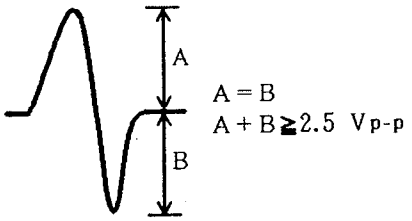


Figura 8

[Juicio sobre el captor]

No juzgue el captor hasta haber finalizado correctamente todos los ajustes. En los casos siguientes es posible que haya algo erróneo en el captor.

1. La amplitud de la señal de error de seguimiento es extremadamente pequeña (menos de 2 Vp-p).
2. La amplitud de la señal de error de enfoque es extremadamente pequeña (menos de 2,5 Vp-p).
3. Las amplitudes de las partes positiva y negativa de la señal de error de enfoque son extremadamente asimétricas (relación de 2:1 o superior).
4. La señal de RF es demasiado pequeña (menos de 0,8 Vp-p) y aunque se ajuste VR1 (potencia de láser), la señal de RF no puede aumentarse hasta el nivel estándar.

8. FOR PD-Z84M/HB, HPW, SD, PD-Z970M/HB AND SD TYPES

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

8.1 FOR PD-Z84M/HB,HPW AND SD TYPES

CONTRAST OF MISCELLANEOUS PARTS

The PD-Z84M/HB, HPW, and SD types are the same as the PD-Z84M/HEM type with the exception of the following sections.

Mark	Symbol & Description	Part No.				Remarks
		PD-Z84M /HEM type	PD-Z84M /HB type	PD-Z84M /HPW type	PD-Z84M /SD type	
◉	Mother board assembly	PWM1370	PWM1370	PWM1370	PWM1371	
⚠	AC power cord	PDG1008	PDG1021	PDG1011	RDG1003	
⚠	Voltage selector	.....	.....	.....	PSB1002	
⚠	Power transformer (AC 220/240V)	PTT1125	PTT1125	PTT1125	.....	
⚠	Power transformer (AC 110/120-127/220/240V)	.....	.....	.....	PTT1126	
	Operating instructions (English/French/ Dutch/Italian/German/Swedish/ Spanish/Portgauess)	PRE1138	.....	.....	.....	
	Operating instructions(English)	.....	PRB1140	PRB1140	PRB1140	
	Operating instructions(Spanish)	.....	.....	.....	PRC1028	

MOTHER BOARD ASSEMBLY (PWM1371)

The mother board assembly (PWM1371) is the same as the mother board assembly (PWM1370) for the service supply parts.

8.2 FOR PD-Z970M/HB and SD TYPES

CONTRAST OF MISCELLANEOUS PARTS

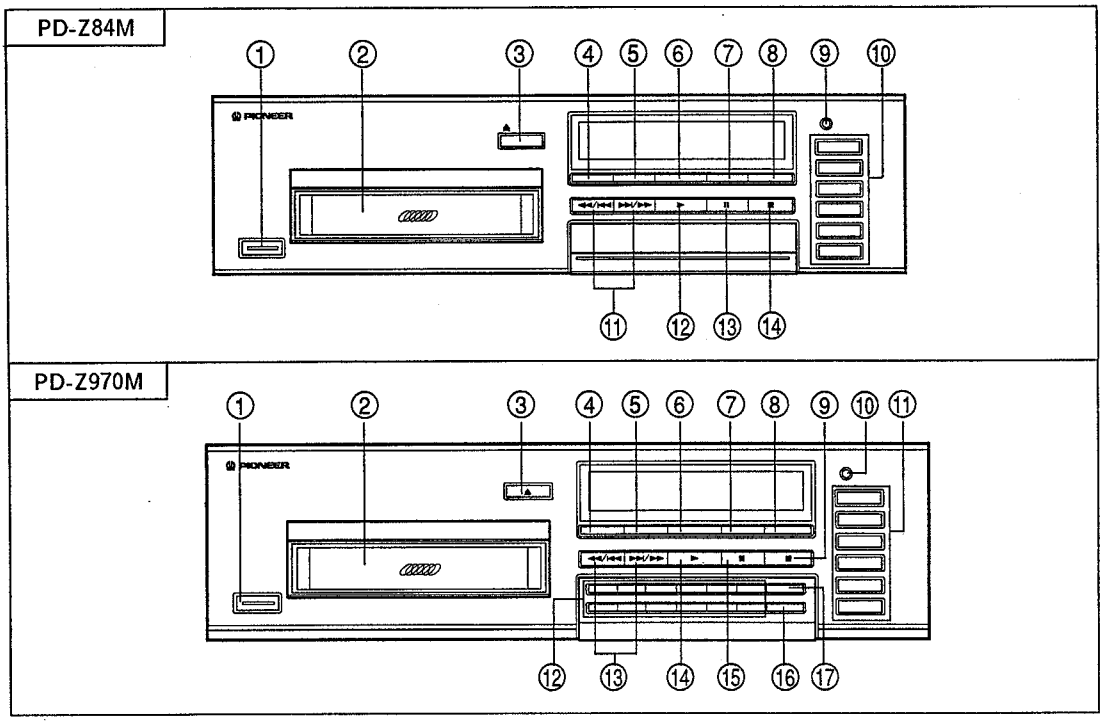
The PD-Z970M/HB and SD types are the same as the PD-Z970M/HEM type with the exception of the following sections.

Mark	Symbol & Description	Part No.			Remarks
		PD-Z970M/HEM type	PD-Z970M/HB type	PD-Z970M/SD type	
◉	Mother board assembly	PWM1368	PWM1368	PWM1369	
⚠	AC power cord	PDG1008	PDG1021	RDG1003	
⚠	Voltage selector	.....	.....	PSB1002	
⚠	Power transformer (AC 220/240V)	PTT1125	PTT1125	.....	
⚠	Power transformer (AC 110/120-127/220/240V)	.....	.....	PTT1126	
	Operating instructions (English/French/ Dutch/Italian/German/Swedish/ Spanish/Portgauess)	PRE1137	.....	.....	
	Operating instructions(English)	.....	PRB1144	PRB1144	
	Operating instructions(Spanish)	.....	.....	PRC1028	

MOTHER BOARD ASSEMBLY (PWM1369)

The mother board assembly (PWM1369) is the same as the mother board assembly (PWM1368) for the service supply parts.

9. PANEL FACILITIES



FRONT PANEL (PD-Z84M)

① POWER ■ STANDBY/▬ ON switch
② Magazine insertion slot
③ EJECT button (⏏)
④ COMPU button
⑤ PGM button
⑥ RANDOM button
⑦ REPEAT button
⑧ TIME button
⑨ HI-LITE SCAN button
⑩ DISC SELECT buttons (1 - 6)
⑪ Manual/Track search buttons
(◄◄/I◄◄, ►►I/►►)
⑫ Play button (►)
⑬ Pause button (II)
⑭ Stop button (■)

FRONT PANEL (PD-Z970M)

① POWER ■ STANDBY/▬ ON switch
② Magazine insertion slot
③ EJECT button (⏏)
④ COMPU button
⑤ PGM button
⑥ RANDOM button
⑦ REPEAT button
⑧ TIME button
⑨ Stop button (■)
⑩ HI-LITE SCAN button
⑪ DISC SELECT buttons (1 - 6)
⑫ Track number/Digit buttons
(1 - 0/10, +10, ≧ 20)
⑬ Manual/Track search buttons
(◄◄/I◄◄, ►►I/►►)
⑭ Play button (►)
⑮ Pause button (II)
⑯ CLEAR button
⑰ DELETE button

10. SPECIFICATIONS

PD-Z84M

1. General

Type ..... Compact disc digital audio system
Power requirements ..... AC 220 V, 50/60 Hz
Power consumption ..... 10 W
Operating temperature ..... +5°C - +35°C
Weight ..... 3.7 kg (8 lb, 3 oz)
External dimensions ..... 360(W) X 290(D) X 105(H) mm

2. Audio section

Frequency response ..... 2 Hz - 20 kHz
S/N ratio ..... 100 dB or more (EIAJ)
Dynamic range ..... 94 dB or more (EIAJ)
Channel separation ..... 93 dB or more (EIAJ)
Wow and flutter ..... Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Channels ..... 2-channel (stereo)

3. Output terminal

Audio line output
Control input jack
Flat cable

4. Functions

Number of discs to be stored — maximum 6.

Basic operation buttons
- Play, pause, stop

Search function
- Disc Search
- Track Search
- Manual Search

Hi-Lite Scan
- DISC HI-LITE SCAN
- TRACK HI-LITE SCAN

Programming
- Maximum 32 steps
- Pause
- Direct program

Repeat functions
- 1 track repeat
- All discs repeat
- Program repeat
- Random play repeat

Random play
RANDOM play (repeat also available)

Switching display
Time consumed, remaining time (track/disc), and total time

Compu Program Editing
Selects the tracks for both sides of the tape within the specified time.

5. Accessories

- Six-compact-disc magazine 1
- Output cable 1
- Control cord 1
- Operating instructions 1

PD-Z970M

1. General

Type ..... Compact disc digital audio system
Power requirements ..... AC 220 V, 50/60 Hz
Power consumption
European, U.K., Australian, U.S., Canadian models ..... 10 W
Other models ..... 10 W
Operating temperature ..... +5°C - +35°C
Weight ..... 3.9 kg (8 lb, 10 oz)
External dimensions ..... 360 (W) X 285 (D) X 121 (H) mm

2. Output terminal

Optical digital output

3. Functions

Number of discs to be stored — maximum 6.

Basic operation buttons
- Play, pause, stop

Search function
- Disc Search
- Track Search
- Manual Search

HI-LITE Scan
- Disc HI-LITE Scan
- Track HI-LITE Scan

Programming
- Maximum 32 steps
- Pause
- Program CLEAR (single track or all tracks)

Repeat functions
- 1 track repeat
- All discs repeat
- Program repeat
- Random play repeat
- Delete play repeat
- Delete random play repeat

Random play
- Random play (repeat also available)
- Delete random play (repeat also available)

Switching display
- Time consumed, remaining time (track/disc), and total time

Compu Program Editing
Selects the tracks for both sides of the tape within the specified time.

4. Accessories

- Six-compact-disc magazine 1
- Optical fiber cable 1
- Operating instructions 1

NOTE:
Specifications and design subject to possible modification without notice, due to improvements.

The Magazine Type Multi-Play CD Players with mark and the Magazines with the same mark are compatible for 5-inch (12cm) discs.